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Aeroplane

Volume 38

Part 2

1930

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v. 38
pt. 2

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April 2, 1930.] Registered at the G.P.O. as a Newspaper. [Vol. XXXVIII. No. 14.

THE AEROPLANE

6d. Weekly.

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C.G.Grey

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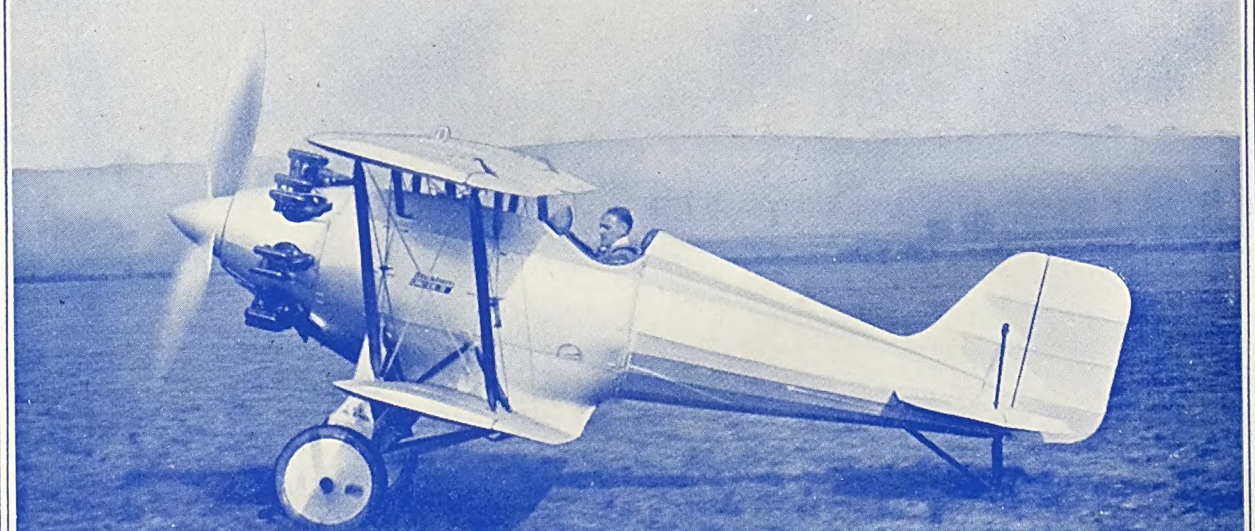
Blackburn
LINCOCK

ALL-METAL LINCOCK
SINGLE-SEATER FIGHTER AND ADVANCED TRAINING MACHINE

ALTERNATIVE POWER UNITS

Supercharged Lynx IV. 215 h.p. Lynx IV.
220 h.p. Geared Lynx VI. 250 h.p. Lynx Major.

Normal military load. 2½-3 hrs. duration. Remarkably high performance in relation to comparatively low power. Exceptional manœuvrability owing to compact weight distribution and well-balanced controls. Very durable construction. Economical to run, and easy to maintain.



THE BLACKBURN AEROPLANE AND MOTOR COMPANY LIMITED,
Head Offices & Works: BROUGH, EAST YORKSHIRE.
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Auto-Auctions Limited
BURLINGTON GARDENS · W·1
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the stuff before too many competitors awake to that particular need in the market, and reasonably good salesmanship to let the market know that the manufacturer can supply those goods. But that line of business has its limitations, because somebody else will discover the market's demands and consequently other competitors will start up at about the same time. Nevertheless it is a good safe way of making money so long as one quits before the market is over-crowded or over-supplied.

The other method not only needs judgment, but it needs considerable foresight and a great deal of courage. For a manufacturer to convince himself that if he makes a certain thing and puts it on the market, the market will rush to buy it, and then for him to risk his capital and energy in making that thing and putting it on the market, needs brains of more than ordinary capacity. For a board of directors to do the same thing entails getting together a number of men of quite unusual qualities—which is far more difficult. There is a kind of axiom, or formula, to the effect that the average mentality of a committee or board is in the inverse ratio of the number of members multiplied by the lowest mentality of any individual member. And the maxim that too many cooks spoil the broth is not cancelled out by the other maxim that in a multitude of counsellors there is wisdom.

The Pioneer's Reward.

In the past thirty-five years or so one has seen many things put on the market which obviously ought to have been a terrific success if the odd millions of people who are known collectively as "the market" had any sense. And one has seen such an enormous majority of these obviously saleable things turn out to be miserable failures that one is almost converted to that peculiarly English form of caution which often looks so very much like stupidity and amounts nearly to a genius for losing opportunities.

We have a habit of sitting tight and watching somebody else take the risks, or do the dirty work, or plough the fields and sow the seeds, till we can step in and reap the harvest or take the profits. And yet at the other end of the scale wherever you go there is always some fool Englishman pioneering everything, butting his silly head against the North or South Pole or stepping out into the Wilderness regardless of consequences.

As a general rule the pioneer does not reap his reward. The sheer obstinacy which makes him carry on as a pioneer against the advice of those who counsel caution generally makes him too obstinate to alter his course, or alter his business methods, or even sit still while things develop, when by doing so he might easily make a fortune. But once in a while one meets pioneers who also have versatility of mind. Several of the pioneers of British aviation have done quite well for themselves. And happily Capt. Geoffrey de Havilland, the founder of the De Havilland Company, and his first ally, Mr. F. T. Hearle, the General Manager of the firm, are among them.

Leading the Fashion.

The first De Havilland aeroplane was made somewhere about 1908, and whatever changes have been made in aeroplane fashions there has always been a D.H. of some sort in the forefront of British Aviation fashion. The D.H. Moth was not the first light aeroplane. But it was the first fashionable light aeroplane. And the history of the Moth is actually the history of aeroplane fashions in the quite new and rapidly growing market of private ownership and public usefulness.

The Moth has been developed as a purely commercial product. Although the first considerable order for Moths came from the Air Ministry, thanks to the foresight and acumen of Air Vice-Marshal Sir Geoffrey Salmond, the De Havilland Company were not paid for experimental work and development expenses, as they would have been if the order had been for an experimental type of war machine. The Air Ministry just bought their Moths across the counter like anybody else.

As more Moths were made the price was lowered and as the price was lowered more orders came in.—price and production reacting on each other in the ordinary commercial way according to the law of supply and demand. There was no spoon-feeding by the Air Ministry, no subsidy, no anything. The Moth, as Civil Aviation should, has always flown by itself.

Advertising.

In another way the Moth has succeeded along proper commercial lines. It has been backed by some of the cleverest advertising that has ever appeared in the Press of any country.

There is too much of a tendency among British manufacturers in all lines of business to treat their advertising as a necessary evil, or as a kind of blackmail which newspapers levy in return for editorial attention. Some British manufacturers would actually prefer the system followed by most French daily and weekly papers of charging so much a line for editorial notice without any display advertising at all, —though, be it said, the French aeronautical papers, such as *L'Aéronautique* and *Les Ailes* do not commit this sin. No English newspaper of repute has yet sunk to selling its editorial space, but at the same time few newspaper editors would be so hypocritical as to pretend that editorial attention is not influenced to some extent by straight advertising.

Apart from that the amount of editorial space given to the best advertisers is largely explained by the fact that the best advertisers get the most business, and therefore have more to be talked about. Also there is the fact that the best advertisers treat their advertising seriously and take

IN MEXICO.—A Gipsy-Moth with a group of Mexican Army officers in Mexico City. This machine was taken over by the Government and used as an observation machine against the Escobar rebels in a recent revolution.

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The Under Secretary of State for Air

Mr. F. Montague, in his statement introducing the Air Estimates in the House of Commons on Tuesday, 18th March, 1930, said:—

"WHILE dealing with the work of the Air Force during the year, I should like also to refer briefly to the long distance flights which were carried out.

Three Fairey 111F aircraft of No. 45 Squadron completed a flight from Helwan, Egypt, to Nigeria and the Gold Coast and back, a distance of 8,400 miles.

Another four aircraft of the same type from No. 14 Squadron undertook the annual flight to Cape Town and back. It may interest the House to know that the aircraft arrived home again at Cairo after a journey of 11,200 miles, late to their scheduled time to the extent of 5 minutes.

Four long distance flights were undertaken during the South West monsoon by No. 205 Squadron, Singapore, with the object of trying out the weather possibilities for flying and the possibilities of maintaining a prearranged time table between Calcutta and Singapore in adverse conditions; and finally I should wish to pay tribute to the gallantry of the two officers who, after having successfully flown non-stop to Karachi, lost their lives in an attempt to make a non-stop flight to Cape Town."

All the flights referred to above were carried out with aircraft fitted with the

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aero engine

D. NAPIER & SON, LTD.
ACTON, LONDON, W.3

Don't experiment—install the engine of proved reliability.

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a lot of trouble to see that anything done by their products which makes news is made known at once to the newspapers.

Where the Moth advertising has been so brilliantly successful is that things have been done on Moths, and Moths have made history and have won races and have beaten records, to such an extent that if the De Havilland Company had never taken a single page of advertising the papers would still have been forced to advertise the Moth editorially practically as much as they have done. And all this news which has been published about Moth performances has been driven home by consistent advertising on a scale which in proportion to the limitations of the aircraft market represents what would be a world-wide advertising campaign in any ordinary household commodity.

Also a great quality about the De Havilland advertising is its persistent variety. Not only are the actual advertisements themselves constantly changed, but the whole style of the advertising keeps on changing. Consequently readers of the aeronautical papers never get to the stage of passing over a De Havilland advertisement because they are so accustomed to seeing it that they do not see it at all.

The variety of De Havilland advertising has been extraordinary. Sometimes it is plain persuasive selling talk. Sometimes it depends on striking pictures. Sometimes it is so quaint that one cannot help studying every word in detail. Sometimes it is so comic that if it were not an advertisement it would be worth a place in *Punch*.

But, and here is one of the great secrets of its success as opposed to nearly all of the advertising which one sees in the ordinary newspapers, De Havilland advertising is never vulgar, or dull or banal. At its funniest it has that same quality which distinguishes the drawings of Fougasse from those of the great majority of comic artists,—one laughs with the subject of the humour and not at him or it. At its most serious it has weight of argument. And at its most sober it has point which convinces.

The Success of Success.

The old adage that nothing succeeds like success has never been better exemplified than in the success of the De Havilland firm in general and of the Moth aeroplanes in particular. How great that success has already become in the limited market which exists at present for civil aircraft may be judged from the accompanying supplement. The amount of business done in Moths may be judged from the fact that something over 1,000 Moths are actually in use and that each of those machines has been sold for something in the region of £700. Probably if one takes in spare engines and other spare parts and so forth one could reckon that each Moth in use represents £750 and considerably more than half of them were sold in the year 1929.

Three-quarters of a million pounds' worth of business built up in so few years is an achievement of which any board of directors might well be proud. Quite a lot of even the most expensive war machines would have to be sold to make up such a turnover. And there is the great advantage about the sale of Moths that by far the greater number of them have been sold overseas so that they have actually brought money into this country, whereas sales to our own Air Ministry are merely taking money out of one pocket and putting it into the other.

The business done so far in Moths overseas is only a very small fraction of the business which will be done in civil aircraft overseas within the next five years. The De Havilland Company with their foresight and energy and appreciation of the value of advertising will get a very big share of whatever business is doing. But there is plenty of room for other people to do good business also.

The future policy of The Aeroplane will always be, as it has always been, to put before the World the merits of British aircraft and the high quality of British workmanship. Not very long ago His Royal Highness the Prince of Wales expressed the fear that our salesmanship was not equal to our workmanship. One hopes that this issue of The Aeroplane will do something to remove such an impression.

Floodlighting.

Following the good example of the Heir to the Throne, his brother, Prince George, addressing the members of the National Advertising Benevolent Society on Mar. 28, said that the advertising trade seemed to him to be "Floodlighting the work and services of man so that each article is better known, better seen, and more keenly desired."

That should be a text henceforth for the British Aircraft Industry. We have had more than enough of "defeatism" and self-depreciation. We have been content too long to sit down and tell ourselves that the Air Ministry is our only customer. Even if it were, we could make it buy more by consistently advertising our goods, and Aviation in general, to the British Public and to Members of Parliament who vote the money. But apart from that, we have the whole World as a market for our Service and Civil aircraft, and we are in on the ground floor of a rising market.

Prince George's words later in his speech to the advertising men are the best possible exposition of his text:—

There was a time when Great Britain's industrial position was too strong to be challenged. Those were the hey-days of Britain's trading. There was then little need for any added illumination. The world could not fail to notice the size of Britain's emporium and knew by experience the "bargains" to be got there.

But that emporium was for a time closed for a five-years' diversion from business to the sterner business of war. The world meanwhile had to shop elsewhere, and other competitors whose shops were still open flourished on the business once done by us.

We are now struggling to recover that business. Many things are needed to win it back, and you, and your profession, can I am sure, supply one essential—the clear, direct, and steady flood-lights necessary to re-illuminate the real value of British goods and the pre-eminence of British skill, industry, and conscience that go to their making.

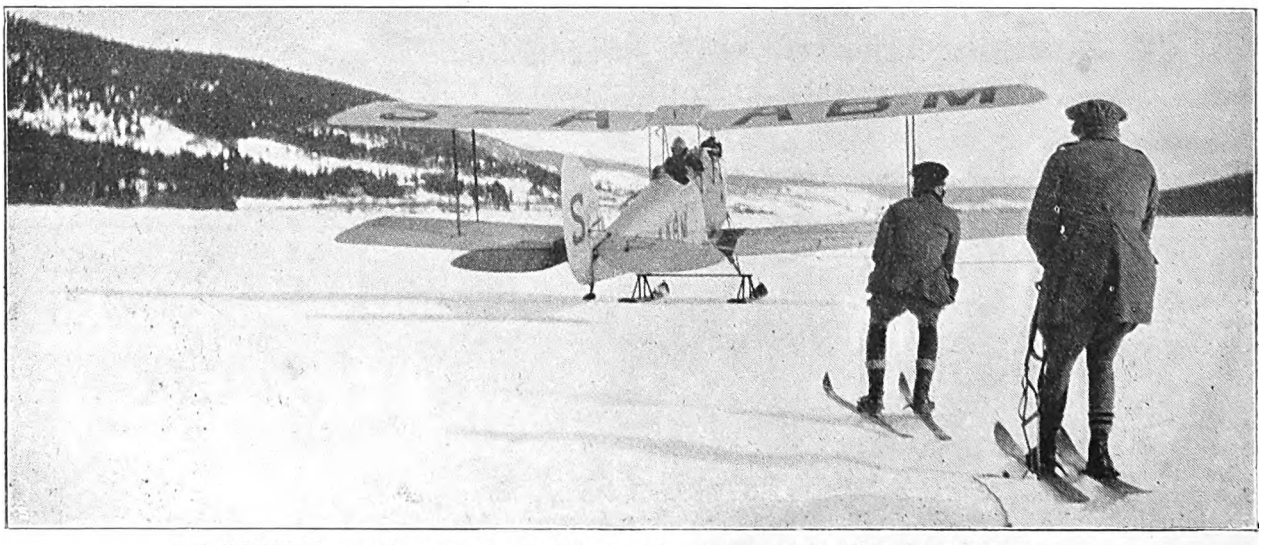
What we want is more orders for goods and commodities. We want our people to supply more of the articles used in this country and more of the articles used abroad. Cannot advertising help to secure this? If so, should not every effort be made to extend our advertising, to improve it if necessary so that it makes known the advantages of buying our own productions instead of those of other countries. I would say—advertise more and advertise to the purpose.

An Illustration.

In his reply the President of the Society, Sir Gomer Berry, gave an astonishing example of what can be done by co-operation in advertising, and by influencing the consumer of goods in the right way. According to *The Times* he said:—

For the "Eat More Fish" campaign the whole trade agreed to a levy of one penny in the pound on the value of all the fish landed, the proceeds of the levy to be spent on advertising. Last year this levy totalled £40,000, and the results of the campaign had been simply amazing.

The revenue of British trawler-owners had been increased by no less than £1,100,000, and the sales of fish had gone up by 37,000



IN SWEDEN.—A Cirrus-Moth providing a new means of traction for ski-joring.

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tons in one year. It had brought new life to the industry. Trawlers which in the ordinary way were laid up for a considerable part of the year were now working full time.

In addition, 72 new boats had already been launched, with the result that the shipyards engaged in building trawlers were working to full capacity. As another important result of this campaign, the trawlers and boats had burned during the year 150,000 more tons of British coal.

That is the real point of this issue of THE AEROPLANE. Its presentation has been made possible by co-operative advertising. The firms who make the raw materials and the component parts and the accessories of aircraft have come in to support one of their best customers, and the result is a display which is definitely worthy of the British Aircraft Industry.

Such a display can only be made with the help of those manufacturers who only benefit indirectly by advertising in aircraft papers. But only by such displays in aeronautical papers—which are in effect the shop windows of the aircraft business—can we hope to compete with the American trade, which sends all over the world every week three or four aeronautical papers each a good deal bigger than this special issue of ours.

This idea of co-operative advertising is not new, even in this country. But it is new in the aircraft business in this country, and, quite frankly, we of THE AEROPLANE have taken the idea from America, along with our coloured covers. As with everything else which we in this country re-import from America, we believe, because we have been told so often, that our coloured covers are, on an average, the most striking artistic productions of their kind yet seen, and beat their American prototypes. So we hope that future co-operative advertising issues of THE AEROPLANE may likewise beat anything America has produced just as our aircraft and aero-engines are the best in the World.—C. G. G.

THE ROYAL AERONAUTICAL SOCIETY.

At the annual general meeting of the Royal Aeronautical Society, held on Mar. 25, the ballot papers for election of the new Council were counted. The voting was the heaviest in the history of the Society. The following is the composition of the new Council:—

President: Colonel the Master of Sempill, A.F.C., A.F.R.Ae.S.

Past-President: Air Vice-Marshal Sir W. Sefton Brancker, K.C.B., A.F.C., F.R.Ae.S.

Vice-Presidents: Air Vice-Marshal Sir Vyell Vyvyan, K.C.B., D.S.O.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., F.R.Ae.S., M.I.Ae.E.; Mr. H. E. Wimperis, C.B.E., F.R.Ae.S.

Council: Capt. P. D. Acland, Prof. L. Bairstow, C.B.E., F.R.S., F.R.Ae.S.; Major T. M. Barlow, M.Sc. (Eng.), M.Inst.C.E., M.I.Mech. E., F.R.Ae.S.; Mr. Robert Blackburn, O.B.E., A.M.Inst.C.E., M.I.Mech.E., F.R.Ae.S., M.I.Ae.E.; Mr. M. L. Bramson, A.C.G.I., F.R.Ae.S., M.I.Ae.E.; Mr. Griffith Brewer, F.R.Ae.S.; Major J. S. Buchanan, O.B.E., A.M.I.Mech.E., F.R.Ae.S.; Major G. P. Bulman, O.B.E., B.Sc., A.F.R.Ae.S.; Wing Cdr. T. R. Cave-Browne-Cave, C.B.E., M.I.Mech.E., A.M.I.N.A., F.R.Ae.S.; Mr. C. R. Fairey, M.B.E., F.R.Ae.S.; Capt. F. T. Hill, F.R.Ae.S., M.I.Ae.E., B.Sc., Wh.Ex.; Capt. A. G. Lamplugh, F.R.Ae.S., M.I.Ae.E.; Mr. W. O. Manning, F.R.Ae.S.; Major R. H. Mayo, O.B.E., F.R.Ae.S.; Mr. T. O. M. Sopwith, C.B.E., F.R.Ae.S.; Mr. C. C. Walker, Assoc.M.Inst.C.E., F.R.Ae.S.; Mr. L. A. Wingfield, M.C., D.F.C., A.R.Ae.S.I.

Honorary Treasurer: Major D. H. Kennedy, O.B.E., F.R.Ae.S.

Honorary Solicitor: Lawrence A. Wingfield, A.R.Ae.S.I.

Honorary Librarian: Mr. J. E. Hodgson.

Honorary Accountant: Mr. A. N. D. Smith, F.I.C.A.

J. LAURENCE PRITCHARD (Secretary).

THE ROYAL AERO CLUB.

The Annual General Meeting of the Royal Aero Club was held on Mar. 26, immediately following the House Dinner. The Right Hon. Sir Philip Sassoon, Bart., P.C., C.B.E., C.M.G., M.P., Chairman of the Club, presided.

The following Members were elected to the Nine vacancies on the Committee:

Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., H. S. Broad, Major C. J. W. Darwin, D.S.O., Lieut.-Col. M. O'Gorman, C.B., Col. F. Lindsay Lloyd, C.M.G., C.B.E., John Lord, Lieut.-Col. J. T. C. Moore-Brabazon, M.C., Major H. A. Petre, D.S.O., M.C., Air Commodore C. R. Samson, C.M.G., D.S.O.

The following were elected President and Vice-Presidents: President, The Duke of Atholl; Vice-Presidents, the Duke of Sutherland and Lord Wakefield of Hythe.

THE CHAIRMAN'S STATEMENT.

Sir Philip Sassoon said that the membership of the Club had been maintained and the organisation of flying interests under the association with it of the Light Aeroplane Clubs had greatly extended and confirmed the influence of the Club. There were still many interested in aviation and desirable as Club members whom those present should each among his own friends and acquaintances endeavour to bring into the fold. Newcomers had much to gain, nothing to lose, little to pay, and the assurance that they were assisting a movement which is very vital to England and the Empire. The year's working showed that the Club was no longer living beyond its income, but, as it should, a trifle within it, namely £350 to the good. This is a satisfactory turn of the tide, after the previous year or so, which showed an excess the other way.

The lease of the Club premises would expire in September 1931 and the question of future accommodation was a matter for serious consideration. The difficulties were considerable and nothing definite had yet been decided upon. The present premises had been secured at a favourable rent, and, in view of the high cost of buildings, the present income of the Club does not allow the kind of premises which the increasing interest taken in Aviation by the great public seemed to warrant. The Club must make a very special effort to meet the demand which was foreseen on every hand.

The activities of the Club had centred on the sporting and touring side of Aviation. The Club had kept touch with the movement in all its developments, whether in utilising the most up-to-date means of recording phenomenal speeds or in redrafting the Code which controls our sport, or in activating the somewhat slow-moving Customs Authorities of various nations to adapt themselves to the needs of flying.

The success in the Schneider Trophy Contest was a cause of pride. The gaining of the World's Speed Record, i.e., 357 miles per hour for Great Britain, was also a fine item in the year's progress.

On the question of Air Touring the Club had formed a special department to deal with the demand for information and facilities of members and associated members. It supplied all the particulars likely to be of use in any contemplated tour. Information was available about air routes, the rules for flying, particulars of aerodromes, landing grounds, prohibited areas, etc., and also about official requirements and formalities on entering or leaving a foreign country.

Large scale maps showing all known aerodromes and landing grounds were available at the Club and special maps for air touring could be prepared and supplied. Flying members had sent in information about their difficulties and suggestions for what might be done to remove them, and they are invited always to do this.

During the past year there had been considerable activity in air touring abroad and the Club had issued a total of 252 carnets. This showed a very large increase over the previous year, when 157 carnets were taken out. The number of British flyers using carnets exceeded that of all the other countries put together.

There had been a substantial increase in the number of flyers who had taken their Aviators' Certificates, thanks to the excellent work of the Light Aeroplane Clubs. During the year 453 Aviators' Certificates were issued,—an increase of 170 over the previous year.

There were now 18 Light Aeroplane Clubs associated with the Royal Aero Club and forming the General Council of Associated Light Aeroplane Clubs. The work of this General Council had been of benefit to all Clubs. Exchange of information and views resulting in co-ordinated action had been very helpful and, where the Government had been approached, the advantage of a full discussion of all points of view had helped all interests.

For example, the recommendations of the General Council to the Secretary of State for Air on the question of a renewed subsidy for the Light Aeroplane Clubs had received sympathetic consideration and all the Light Aeroplane Clubs had the satisfaction of knowing not only that they had done great service very economically to the State, but that they were to continue to receive a Government subsidy.

Also, the many flying meetings and air rallies organised by the Clubs all over the country had done a great deal towards the spread of air-mindedness.

Apart from the Light Aeroplane Clubs in this country the Aero Clubs in India, Australia, South and East Africa and Singapore were all affiliated to the Royal Aero Club, thus keeping the Club in contact with the aviation activities of the Empire overseas.

During the year the Flying Services Fund of the Royal Aero Club had distributed in grants and allowances to the dependents of deceased airmen £501 15s. Included in this sum were grants towards the education of children of the deceased airmen.

The Club was represented on the following bodies:—*The Fédération Aéronautique Internationale*, The London Chamber of Commerce (Civil Aviation Section), The British Corporation Register of Shipping and Aircraft, Lloyd's Register of Shipping, The Standing Joint Committees with the Royal Aeronautical Society, Air League and Society of British Aircraft Constructors, The Royal Air Force Memorial Fund.

Perhaps members did not know that a very large number of Committees of the Royal Aero Club were working on the various subjects connected with aviation. In the Schneider Contest last year there were six different Committees whose work extended over four months with meetings regularly every week. He expressed thanks to the members of these Committees and especially to Lieut.-Col. Mervyn O'Gorman, the Vice-Chairman.

After the Chairman's speech, Mr. M. L. Bramson asked whether anything was being done about the proposal that a building worthy of British Aviation should be taken over, in which the Royal Aeronautical Society, the Royal Aero Club, the Air League, and the Society of British Aircraft Constructors could all be housed, as are the corresponding societies in Germany. Mr. Bramson suggested that the Endowment Fund of the R.Ae.S. would be available for securing such premises.

Lt.-Col. Darby, on behalf of the Committee, stated that the matter was having careful consideration.

AIRSHIPS VERSUS AEROPLANES.

A debate on Lighter-than-aircraft *versus* Heavier-than-aircraft in which the principal speakers were Commander Sir Dennistoun Burney and Mr. F. Handley Page, was held at the Forum Club on Mar. 25. The Hon. Mrs. Forbes Sempill was in the Chair.

The report of the Debate will appear in THE AEROPLANE next week. Lack of space has prevented its publication in the current issue.

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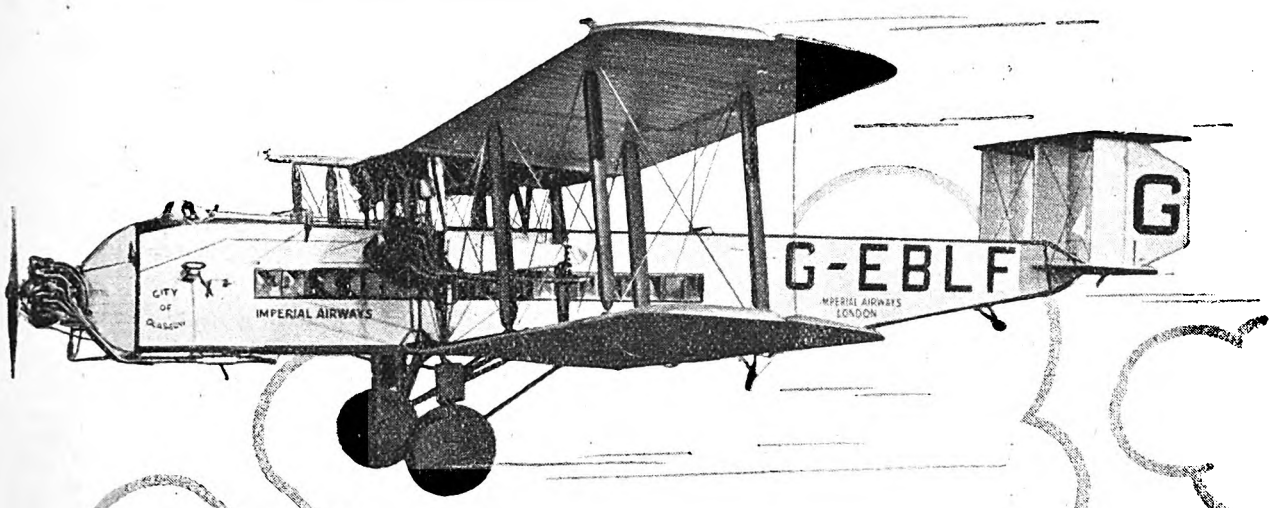

OVER 1,000,000 MILES

IN just over 4 years seven Argosies in the European Fleet of Imperial Airways Limited have flown 1,023,075 miles in approximately 11,296 hours. They have carried over 80,000 passengers; they have crossed the Channel approximately 4,200 times.

The Argosies are the safest, best paying and most easily maintained air liners in existence.

ARGOSY AIR LINERS

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Works and Aerodrome: Whitley, Coventry.

London: 10, Old Bond Street, W.1.

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GENET SUCCESS IN FRENCH PLANE

AN Albert monoplane fitted with an Armstrong Siddeley Genet engine recently made a successful attack on the altitude record for light aircraft, single seaters, 3rd category, 350 Kgs., the official figure being 7,730 m. (25,509 ft.).

The engine was standard and ran for one hour fifty minutes at 2,200 r.p.m. The total duration of the flight lasted 2 hours 10 minutes at temperatures varying between plus 10 degrees and minus 35 degrees.

ARMSTRONG SIDDELEY

MOTORS LIMITED,
COVENTRY, ENGLAND
and
10, Old Bond St., London, W.1.

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, March. 25.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—The following are granted S.S. comns. as Plt. Offs. on probation with effect from and with seniority of Mar. 14:—L. H. Anderson, W. A. A. Ashcroft, E. G. Barter, G. Burdick, N. Daunt, A. P. Glenny, W. Halmshaw, T. King, W. E. L. Lewis, T. J. MacDermot, D. M. T. Macdonald, R. I. G. MacDougall, B. J. McGinn, P. H. Maxwell, R. T. S. Morris, J. C. F. Peacock, G. B. Pierpoint, W. A. Richardson, W. A. J. Satchell, H. A. Simmons, L. Sloman, E. C. Van Oppen, A. W. Vincent, R. G. Wilde, J. D. Woodland.

The following Plt. Offs. are promoted to the rank of Flg. Offs.:—F. Whittle, J. Mutch (Jan. 28); R. A. Beynon, M. G. Parker, S. P. Richards, R. Jones (Feb. 24).

Flg. Off. (Hon. Flt. Lt.) U. C. de Burgh relinquishes his S.S. comn. on completion of service (Mar. 20); the S.S. comn. of Plt. Off. on probation D. McGregor-Cheers is terminated on cessation of duty (Mar. 26); Lt. R. H. S. Rodger, R.N., Flg. Off., R.A.F., ceases to be attached to the R.A.F. on return to Naval duty (Mar. 19).

MEDICAL BRANCH.—Flt. Lt. E. J. T. McWeeney, M.B., B.Ch., is transferred to the Reserve, Class Di (Mar. 24).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—J. P. R. Oakes is granted a comn. in Class A.A. (ii) as a Plt. Off. on probation (Mar. 13); J. W. Brown is granted a comn. in Class A as a Flg. Off. on probation (Mar. 25).

The following Flg. Offs. are transferred from Class A to Class C:—E. F. D. Gregory (Dec. 15, 1929); H. C. Macphail (Nov. 30, 1929); Flt. Lt. D. Craik, D.F.C., ceases to be employed with the Regular Air Force (Mar. 20); Flg. Off. G. D. Emms relinquishes his comn. on appointment to a perm. comn. in the R.A.F. (Mar. 8).

AUXILIARY AIR FORCE.

GENERAL DUTES BRANCH.—No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—The following to be Plt. Off.:—The Hon. William D. S. Montagu (Feb. 12).

The King's Levée.

His Majesty the King held a Levée at Buckingham Palace on Mar. 27. Among those in attendance upon His Majesty was Air Marshal Sir Edward Ellington, Principal Air Aide-de-Camp.

The following officers of the R.A.F. were among those presented to the King by the Secretary of State for War:—

Webb-Bowen, Air Vice-Marshal T., C.B., C.M.G., on appointment as Air Member for Personnel on the Air Council; Crowe, Sq. Ldr. H., M.C., on appointment; Cull, Group Capt. J., D.S.O., on appointment; Dalzell, Flt. Lt. W., on appointment; David, Flt. Lt. E., on appointment; Ellington, Air Marshal Sir Edward, K.C.B., C.M.G., C.B.E., A.D.C., on promotion and on appointment as Principal Air Aide-de-Camp to the King; Elworthy, Flt. Lt. L., on appointment; Evill, Wing Cdr. D., D.S.C., A.F.C.; Fiddament, Sq. Ldr. A., D.F.C.; Fogarty, Flt. Lt. F., D.F.C., on appointment; Halahan, Air Vice-Marshal F., C.M.G., C.B.E., D.S.O., M.V.O.; Harrison, Sq. Ldr. R., D.F.C.; Haskins, Group Capt. F., D.S.C.; Henderson, Wing Cdr. M., D.S.O.; Ludlow-Hewitt, Air Vice-Marshal E., C.B., C.M.G., D.S.O., M.C., on promotion; Hume, Sq. Ldr. D.; Longmore, Air Vice-Marshal A., C.B., D.S.O., on promotion and on appointment as A.O.C., R.A.F., Cranwell; Macdonald, Flt. Lt. S., D.F.C., on appointment; Macfadyen, Flt. Lt. D., on appointment; Martingell, Sq. Ldr. G., A.F.C., on promotion; Massey, Flt. Lt. H., M.C., on appointment; Maycock, Wing Cdr. R., O.B.E.; Newall, Air Vice-Marshal C., C.B., C.M.G., C.B.E., A.M., on promotion; Opie, Flt. Lt. W., on appointment; Salmond, Air Chief Marshal Sir John, K.C.B., C.M.G., C.V.O., D.S.O., on appointment as Chief of the Air Staff; Spicer, Group Capt. M., on promotion and on return from special service abroad; Trenchard, Marshal of the R.A.F. the Lord, G.C.B., D.S.O., D.C.L., LL.D., on being created a Baron; Wood, Wing Cdr. J., on promotion.

The Automatic Observer.

A description of the Automatic Observer, the first reference to which was made in THE AEROPLANE of Mar 19, has been issued by the Air Ministry as follows:—

For the measurement of aircraft performance it is necessary that a number of instruments be read simultaneously, a condition which in practice can only be approximately realised, particularly on single-seater aircraft, where the pilot must also navigate the aircraft and keep a watch on the behaviour of the engine.

The R.A.E. Automatic Observer was designed to give a permanent record of the simultaneously timed readings of several instruments. It consists of a light-proof box with an illuminated base-plate on which are mounted an altimeter, a stop-watch, a revolution-counter, and air-speed indicator, a thermometer and two cross-levels. Carried on a bracket above is a short-focus cinema-camera holding a roll of film and operated by a clockwork mechanism which is controlled electrically by means of a push-button, or an automatic interrupter-switch. A camera trip release is held by a pivotted forked arm connected to an iron cylinder which is arranged to slide over an electro magnet, the return movement being effected by means of a spring. On the switch being closed the base-plate and instruments are illuminated and the camera is started.

In use during test flights the switch is closed every 25 or 30 seconds, and for each contact two or three photographs are taken. These can be examined at the conclusion of the flight.

Promotions.

In the House of Commons on Mar. 26, in reply to a question by Mr. Beaumont (for Capt. Balfour), the Under-Secretary of State for Air said that the numbers of promotions of permanent officers (General Duties Branch), from Flight Lieutenant to Squadron Leader, and from Squadron Leader to Wing Commander, had been 26 and 14, respectively, in the financial year 1927-28, 53 and 21 in 1928-29, and 57 and 29 in 1929-30.

The Carslake Prize.

The Henry Leigh Carslake prize for 1930 has been awarded to Lieut. A. D. Torlesse, of H.M.S. *Courageous*.

This prize is awarded annually to the Naval Observer who has completed his training as such, and who, in the opinion of the Admiralty, submits the best essay dealing with the work and development of the Fleet Air Arm.

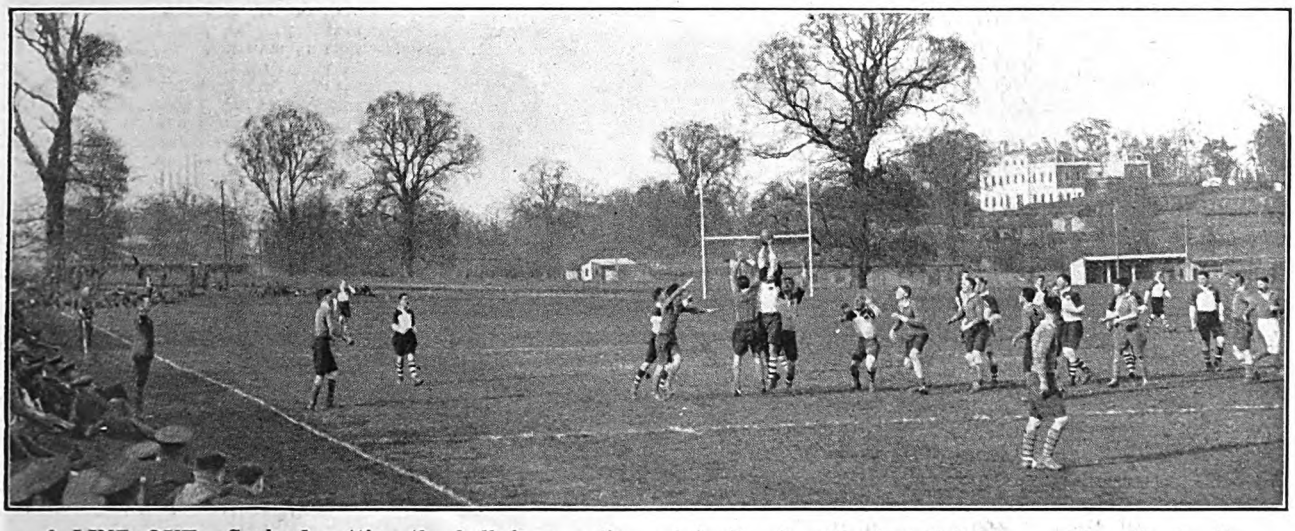
The R.A.F. Staff College Examination

The qualifying examination for the R.A.F. Staff College (10th course) will be held on Jan. 27, 28, and 29, 1931.

Lists of names of officers recommended for the Staff College Course and to sit for the examination are to be forwarded so as to reach the Air Ministry by Nov. 1, 1930.

Civil Flying Meetings.

In the House of Commons on Mar. 26, in reply to a question by Mr. Malone, the Under-Secretary of State for Air said that R.A.F. Units were allowed to take part in flying meetings organised by private aero clubs; the decision as to which clubs should have R.A.F. assistance rested with the Air Council. The assistance which, with due regard to Service training requirements, could be given by the R.A.F. to these meetings was very limited, and its most appropriate allocation was determined by the Air Council in the light of



A LINE OUT.—Sealand getting the ball from a line out in the Cup Final at Uxbridge on Mar. 26 In the background is Hillingdon House, the Headquarters of the Air Defence of Great Britain.

—("Aeroplane" photograph.)

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the recommendations of the Royal Aero Club, who obtained the advice of the General Council of Associated Flying Clubs.

Mr. Malone pointed out that this procedure penalised clubs which were not affiliated to the Royal Aero Club, and Mr. Montague said that he was willing to consider any further point that might be involved.

Municipal Airports.

In the House of Commons on Mar. 26, in reply to a question by Mr. Beaumont (for Capt. Balfour), the Under-Secretary of State for Air said that he regretted that it was impossible to agree to the suggestion that R.A.F. Units should be detached, when Service duties permitted, to take part in opening ceremonies of municipal airports. The assistance which was already being given by the R.A.F. to civil flying meetings was the utmost that could be done in that respect, and he was advised that Service training requirements precluded absolutely the extension of such assistance to the ceremonies to which he referred.

Demolition of Unexploded Bombs.

An Air Ministry Weekly Order states that when practice bombing is carried out every effort is to be made by the bomb aimer to detect and report any bombs which fail to explode. Although this is not always possible when dropping salvoes, if any bomb is suspected of having failed, its approximate position is to be recorded by the bomb aimer and reported on landing.

Every endeavour is to be made by the safety officer in charge of the range to locate and demolish such bombs as are known or suspected to have failed, before the danger area is considered clear.

At ranges where the immediate location and demolition of unexploded bombs is impossible owing to flooding or some other cause, or when such bombs may become exposed, through the action of tides or the process of time, or when the presence of such bombs is known as suspected, arrangements are to be made for the periodical inspection of the range area and demolition of any bombs discovered.

Lodging and Travelling Allowances.

In the House of Commons on Mar. 26 Mr. Beaumont (for Capt. Balfour) asked the Under-Secretary of State for Air in what directions and to what financial extent the Air Ministry considered the recently introduced scales of lodging and travelling allowances would be of benefit to R.A.F. officers below the rank of Group-Captain.

Mr. Montague circulated the following reply:—

The revision of the regulations in question will benefit officers below the rank of group captain in the following respects:—

(1) The rates of lodging allowance for stations outside Europe are being increased for both married and single officers.

(2) Lodging allowance will be issued to married officers during absence from duty in certain circumstances not previously recognised.

(3) A new furniture allowance of 2s. a day, in addition to lodging allowance, will be issued to married officers for whom furnished married quarters are not available.

(4) The new rates of subsistence (travelling allowance) will not be subject to deduction of ration allowance, as are certain of the present rates.

(5) Conveyance of furniture will be allowed for married officers on permanent change of station in the United Kingdom as a new concession.

(6) Certain other concessions will be made as regards travelling expenses of officers and their families in the circumstances set forth in paragraphs 2 to 9 of the Air Ministry Weekly Order No. 58 of 1930.

Colonial Allowances.

In the House of Commons on Mar. 25, in reply to a question by Mr. Hore-Belisha, the Under-Secretary of State for Air said that the Colonial allowance rates for officers and men serving in the Sudan were subject to periodical revision and had been reduced on the basis of a comparison of the cost-of-living in the Sudan with the cost-of-living in this country.

Central Flying School Categories.

The following officers and airman pilots have been re-categorised as under from the dates stated against their names:—

A.2 to A.1.—Flight Lieutenants A. P. K. Hattersley, 10.1.30; A. W. Bates, 9.1.30; F. V. Beamish, 31.1.30. Flying Officers M. Lowe, 9.1.30; G. J. C. Mahony, 26.2.30. No. 407258 Sjt. Kirlew, R. E., 10.1.30. No. 29774? F-S. Marsh, H. A., 21.2.30.

B to A.2.—Flight Lieutenants G. R. M. Clifford, 13.3.30; F. H. Shales, 8.1.30; P. G. Chichester, 9.1.30. Flying Officers V. F. Moir, 14.2.30; G. W. Tuttle, 21.2.30; J. A. Hindall, 15.1.30; M. G. Philpott, 8.1.30. No. 332793 Sjt. Ealey, H. P., 14.2.30; No. 335356 Sjt. Rawlinson, J., 9.1.30; No. 335997 Sjt. McRae, J. A., 9.1.30.

C. to B.—Flying Officer G. E. Klein, 21.2.30.

The following officers are awarded the "B" category as from the dates stated against their names:—

Sq. Ldr. C. W. Mackay, 14.3.30. Flg. Off. D. S. Green, R.A.F.O., 15.2.30.

The following officers are awarded the "B" category under para. 353, clause 9 (*e*), of K.R. and A.C.I.:—

Flight Lieutenants S. E. Storrar, O. E. Carter, G. Tyrrell, M.C., C. D. Adams, G. A. Hadley.

No. 10 Squadron Re-Union.

The third re-union dinner of all ranks of No. 10 Squadron, R.A.F., was held on Mar. 15, at the Bridge House Hotel, E.C. Over 70 members of the Squadron attended, including the former Commanding Officer, Major K. D. P. Murray, M.C.

Past and present members of the Squadron who would like to attend future re-unions, should communicate with A. F. Williams, "Rozel," Amersham, Bucks.

No. 46 Squadron Re-Union.

The annual re-union dinner of No. 46 Squadron will be held at the Victoria Hotel (Oak Rooms), Northumberland Avenue, W.C., on April 12 (Boat Race night) at 7 p.m., for 7.30 p.m. The inclusive cost will be 25s. per head.

All those who wish to attend should communicate, as soon as possible, with C. J. Marchant, 91, Queen Victoria Street, E.C.4.

The Imperial Services Boxing Tournament.

The finals of the Imperial Services Boxing Championships were held at the Stadium Club on Mar. 27, the previous rounds having been decided at Wellington Barracks during the afternoon of the same day. Of the fourteen championships the Navy won five, the Army five, and the R.A.F. four. Last year the Army won eleven bouts, the R.A.F. three, and the Navy one.

One of the best fights of the evening was between Flg. Off. McLean and Lieut. Dalrymple for the Officers' Middle-weights. Mr. McLean, who lost to Lord Malcolm Douglas-Hamilton in the R.A.F. Officers' Light-Heavy-weights, put up a splendid show. He has improved enormously since last year and boxes in first class style. His agility in the first round gave him more points than the steadier Army man. The second round was a miracle of hard punching on both sides without a knock out, but Dalrymple looked groggy towards the end. In the third round both boxers were leaning on each other too exhausted to stand upright.

Another good fight was in the Officers' Feather-weights. Plt. Off Purcell gave away inches in height and reach and, one would imagine, several years in experience, but he fought a gallant fight and took a tremendous hammering without going under and always returned to the attack.

In the Officers' Light-weights Plt. Off. Noblston walked over Lieut. Huxham, who was unfit.

In the Officers' Welter-weights Plt. Off. Abbott was beaten on points in the preliminary round by Lieut. McCully. Mr. McCully outfought Mr. Moffatt, R.N., in the final, and the Referee stopped the fight in the first round.

In the Officers' Light-Heavies Plt. Off. Lord Malcolm Douglas-Hamilton beat Lt. P. G. Davis in the preliminary round on points, but was beaten by Lieut. Formby, R.M., in the final. The fight in the final was disappointing. Douglas-Hamilton adopted a crouching attitude and although he got home a few good jolts and covered up well he was slow to lead and in no way showed the same form as he did in the R.A.F. Championships.

In the Officers' Heavy-weights Lieut. Gregson, R.N., beat Plt. Off. Williams in the preliminary bout on points and Lieut. Faithful in the final. Lieut. Gregson walloped Faithful round the ring a couple of times and the Referee stopped the fight.

On the whole the Other Ranks fights were not so good as the Officers. In the fly-weights AA. Hobbs was beaten by OS. Saxton on points in the preliminary round. Saxton was knocked out by Sjt.-Instructor Haslam in the first round of the final with a beautiful straight left.

The R.A.F. won the Other Ranks' Bantam-weights, AC. Johnson beating Stoker Sullivan, having walked over Bandsman Jones. Johnson was knocked down in the first round but got the best of all three rounds. Sullivan was obviously, even painfully, susceptible to body blows, a fact of which Johnson was quick to take advantage.

The Other Ranks' Feather-weights was fairly even. Sjt. Davidson, R.A.F., had beaten Stoker McCormack, R.N., on points in the preliminary round and was beaten by Cpl. Jones, Army, in the final on points after a good fight. Probably if Davidson had not had a fight during the afternoon he would have won.

The R.A.F. also won the Other Ranks' Light-weights, AC. Herlihy beat LS. Jenkins, R.N., on points in the afternoon and Drummer Quilter on points in the evening. Herlihy and Quilter rained blows on each other through three rounds, but Herlihy was the stronger man.

In the Other Ranks' Welter-weights AB. Warnes, R.N., who had beaten Pte. Barr, beat Sjt. Harper (R.A.F.) on points. The final was a grim duel between two old stagers, neither of whom seemed able to hurt the other.

AC. Clapp, the promising R.A.F. Middle-weight, was badly beaten by AB. Dyer (R.N.) and retired in the second round. Both started well, but after Clapp had been knocked into a backwards somersault in the first round they both boxed wildly and threw away chances. Clapp seemed very dazed in the second round and after a few blows gave up.

The final of the Other Ranks' Light-Heavy-weights was between L/Cpl. Kennedy, who had beaten AC. Watt in the second round of the preliminary round, and AB. Scudder, who deputised for Marine Coleman. Scudder is a born fighter and outfought the more scientific Kennedy.

The Other Ranks' Heavy-weights showed a plucky display by AB. Judge, who stood up to Signalman Stuart for three rounds although badly beaten. Stuart, who was unruffled even to his hair, had previously beaten L-AC. Jones in the first round.

After the last fight the prizes were presented by the First Lord of the Admiralty, who said that he had just come from the Naval Conference, which he hoped would end as well as the Boxing Tournament had done.—C. M. MCA.

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ESTHONIA ADOPTS THE "Bristol" BULLDOG.

ON FOUR CONTINENTS THE "BRISTOL" BULLDOG IS IN SERVICE TO-DAY.

The Esthonian Government have placed an order with the Bristol Aeroplane Co., Ltd., for the supply of "Bristol" Bulldog single-seater fighters.

The order was obtained in the face of keen competition from manufacturers all over Europe, but Esthonia, following the example of Great Britain, Latvia, Australia and other countries in which Bulldogs are in service, decided in favour of the Bulldog.

This choice was dictated not only by reason of the outstanding performance of the Bulldog, but also because of the excellence of its design and all-steel construction, its great strength, and its ease of maintenance and upkeep.

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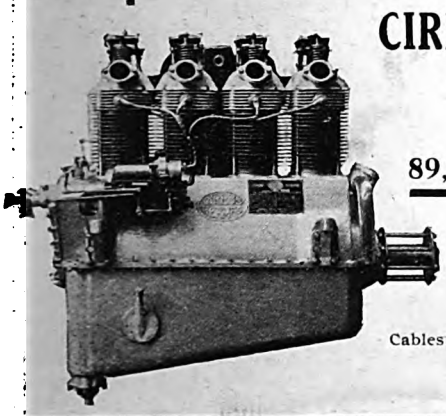

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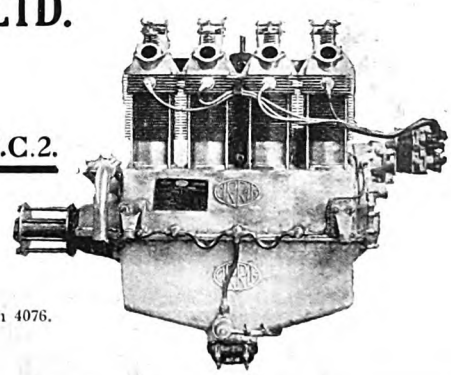

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certain voice. In anguished moments of doubt, players of commissioned rank were incited to even greater efforts by shrieks and roars from the line, in which they were addressed by friendly nicknames or even by their Christian names. But the deed of valour having been successfully accomplished, the hero was acclaimed with a somewhat subdued murmur of "Oh, well played, *Sir*." The female supporters made up in noise what they lacked in numbers, and, if their criticisms were inclined to be harsh at times, their enthusiasm for their own side knew no bounds. The war-cry of the Sealand supporters was "Never in doubt," an optimistic motto which proved very true in this case and might well be adopted by the R.A.F. Station, Sealand, for all time.

It is interesting to note that both Sealand and Gosport are "Junior" R.A.F. Stations, which means that they are both of under 500 in strength.—C. M. MCA.

Association Football.

The Inter-Services Association Football Tournament was carried a stage farther on Saturday, March 29, when the Royal Navy and Royal Marines met the Royal Air Force on the Millwall F.C. ground at New Cross. The result was a win for the Navy by three goals to one.

The match virtually settled the Service championship, as it seems very unlikely that the Army are strong enough to prevent the Navy from claiming the honours. Until the last thirty minutes of Saturday's game the R.A.F. looked as though they would take the points and the championship, but a low, dazzling sun unsettled the defence, and the Navy forwards, following up the scheming of their halves, turned the tables and brought about a very complete and decisive defeat for the R.A.F.

Both teams were in splendid form and gave a large crowd a delightful exhibition of football. In the first half, play was almost confined to midfield, neither side being able to make very much progress. The R.A.F. attack was probably more effective and caused the Navy goalkeeper some very anxious moments despite the fact that the Navy halves were very strong. Kelly was always a source of danger and on more than one occasion deserved to open the score.

The Navy were allowed little chance of getting near the R.A.F. goal and their long shots seldom gave Chaston any trouble. About two minutes before half-time Hickey took the ball down the wing and passed across to Vernon, who put the Air Force ahead with a powerful drive at close range.

A heavy shower made the ground treacherous after the resumption and this was followed by brilliant sunshine. As the sun got lower the R.A.F. defence became more worried and the Navy were quick to take advantage of it. Their right-half was primarily responsible for the first two goals, sending his wings away with brilliant passes. The third goal came from the centre and was the result of bad judgment on the part of Bond, who until then had played one of his best games.

The R.A.F. attack tried until the final whistle to even things up but the tide had turned and little progress could be made towards the Navy goal.

During the interval the Band of the Royal Naval Division gave a display, which met with much enthusiastic applause. These matches in future are to be played on the grounds of the London professional clubs and should attract large crowds. On Saturday the spectators were mostly civilian, but the Navy were represented very well, vocally at least, by a large number of boys from Greenwich and Service men from various stations. It was disappointing to notice that the R.A.F. were hardly represented at all.—C. A. S.

Their Meed of Praise.

Mr. Scullin, the Australian Prime Minister, has telegraphed to Flg. Offs. Piper and Kay, congratulating them on the successful completion of their flight from Croydon to Australia.

As reported in The Aeroplane for Mar. 26, this flight was made in a Desoutter cabin monoplane (Cirrus-Hermes engine).

The R.Ae.S. at Halton.

On Mar. 24, L. A/A. Edward J. G. Jacobs, Stud. R.Ae.S., read a paper on "Metal Construction and Aircraft" before the Halton Branch of the Royal Aeronautical Society. Lt.-Col. A. F. S. Caldwell, C.B.E., D.S.O., M.A., was in the chair and R.A.F. apprentices formed the greater part of the audience. This was the first lecture of a series to be given by apprentices. Medals will be awarded annually for the best lectures.

AN EXILE RETURNS.

His many mere Saxon friends will be interested to hear that Mr. M. A. Doyle, late of the Directorates of Scientific Research and Technical Development at the Air Ministry, has accepted the post of Aeronautical Engineer to the Army Air Corps of the Irish Free State. Not only has Mr. Doyle done excellent work at the Air Ministry for a number of years, but he has also been a valuable member of the Aeronautical Nomenclature Sub-Committee of the British Engineering Standards Association which some years ago compiled the official glossary of the aeronautical language and is at present engaged in revising that publication. All will wish Mr. Doyle success in his new work.

THE AIR ESTIMATES.

The Report stage of the Debate on the Air Estimates in the House of Commons was reached on Mar 25 in the House of Commons.

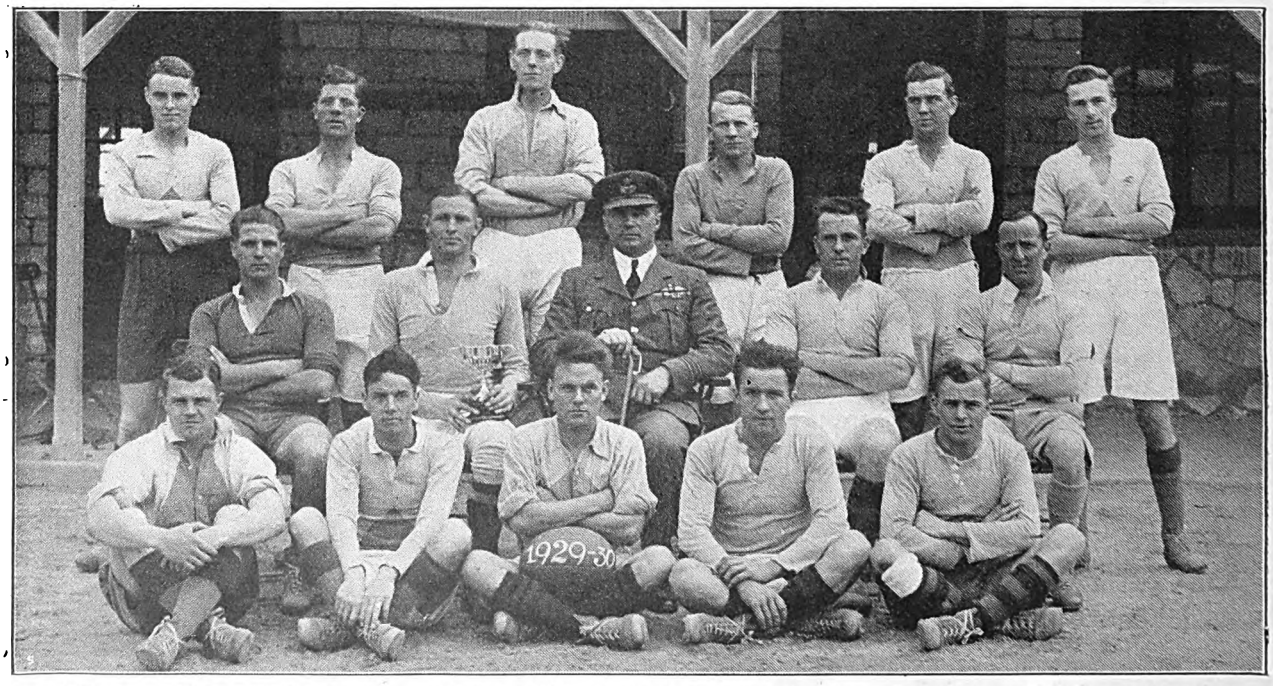
Sir Samuel Hoare asked for further information about the employment of short-service officers after their term on the active list had expired. He also asked for further information about the future employment of the High Speed Flight.

Captain Harold Balfour again probed into the regulations which govern the allowances of officers who are serving overseas. He also suggested that the expenses of the Recruiting Staff could be reduced by allowing R.A.F. Other Ranks to wear plain clothes off duty.

The Under-Secretary of State for Air said that the number of officers whose names had been on the books of the association for finding them work during the year was 245. Of these 20 had been granted permanent and medium service commissions: 64 of them were known to have been privately placed: 33 were presumed to have been placed privately as they had failed to keep in touch with the association: 107 had been directly placed by the association, leaving only 21 who were still to be placed.

High speed research would go on at Felixstowe.

Speaking generally, officers were no worse off under the new allowances regulations.



MIDDLE EAST RUGGER.—The Rugby Football team of No. 45 (Bomber) Squadron, which won the Command Rugby Cup, R.A.F., Middle East, for the season 1929-30. Back row, left to right: AC. Hurnell, L-AC. Brisley, Sjt. White, Sjt. Newton, L-AC. Howard, L-AC. Ridd. Middle row: Sjt. Cardwell, Flt. Lt. Stanley-Turner, Sq. Ldr. Vincent, Sjt. Bailey, Flg Off. Fachiri. Front row: L-AC. Lemon, L-AC. Deane, L-AC. Fahy, L-AC. Wiseman, Cpl. Palmer.

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He did not think there was any real evidence of a desire by airmen to wear plain clothes more frequently.

Sir Samuel Hoare asked about the progress of the new College buildings at Cranwell.

Captain Harold Balfour asked why new buildings and equipment were being put up in Egypt outside the Canal Zone when the R.A.F. would be moving shortly to the Canal Zone.

Rear-Admiral Beamish asked what was going on at Singapore.

The Under-Secretary of State for Air said that the Air Ministry was pressing on with all possible speed with the completion of the new building at Cranwell.

No work was being done in Egypt outside the Canal Zone that was not absolutely necessary.

The Air Force Station at Singapore was a Far Eastern Station and was apart from any question of policy with regard to the Singapore Base as a whole.

Sir Samuel Hoare asked for further information about the Autogyro and about the Pterodactyl. He also asked for information about the development of flying-boats and the investigation into noise.

Lieut.-Cdr. Kenworthy said he thought the question of noise was exaggerated. He thought research into flying in fog and dust would be very valuable. He protested that a certain gyroscopic compass was on the secret list and not allowed to be sold to the commercial user. He would like to know what arrangements we had for pooling scientific inventions, concerned with flying, with other countries.

Captain Balfour ranged himself on the side of the people who did not like noise in aeroplanes. He wanted to know whether any money was being voted for the development of gliding, soaring flight, and whether they would give practical help to the British Gliding Association. He wanted to know whether we were making any advance in night flying and getting away from the sort of "Guy Fawkes flares" towards the American system of proper searchlights. He hoped that the money would be found for another long-distance aeroplane. He protested against civil aircraft being tested by Service pilots at Martlesham Heath and said that the cost of testing civil machines should come into the Civil Aviation Vote.

Rear-Admiral Sueter asked what research had been made into the capabilities of heavy oil engines for airships, whether they could get a better aluminium alloy than duralumin, whether they had found a substitute for gold-beater's skin and whether gas-bag material or outer cover material had been sent to India or Egypt for climatic test.

The Under-Secretary of State for Air said that three gyroplanes were at present under trial in addition to an autogyro flying-boat. A new autogyro would be ordered this year to embody all the experience obtained up to date. Progress in this type had been fairly satisfactory. There was no doubt about the possibility of its service for ordinary civil flying but for any Service purposes it would hardly be suitable.

A new design of Pterodactyl had been put in hand,—a three-seater cabin aircraft with a 112 h.p. engine.

A new type of flying-boat would be introduced into the Service this year. It would be selected from four types now under consideration. There were two general-purpose civil aircraft in the 1929 programme and a large twin-float seaplane.

The question of noise was being thoroughly examined at the N.P.L.

There was greater opportunity for gliding in Germany and on the Continent where there was more suitable country. The principle of international pooling of ideas of research had been recognised and carried out in the past.

He could not say how much time was spent on civil work at Martlesham and the whole question of airworthiness was being considered by the Aviation Consultative Committee.

Lieut.-Cdr. Kenworthy asked for an air route from Germany to the West of Ireland and said that it could eventually be linked up with the Atlantic passage, and asked for the next Schneider Contest to be held in the Humber. He hoped the Air Minister would turn his eyes for a moment from the jungles of Africa and the deserts of Arabia and consider the industrial centres of Northern Europe. He was anxious to speed up the last part of the air route to Australia and again raised the Persian and Italian frontier questions.

Mr. Everard asked what constituted an approved light aeroplane club. The new subsidies were quite inadequate for the clubs. He would like to know how many new landing grounds and aerodromes National Flying Services had started since the scheme came into operation.

Captain Balfour asked for better facilities for the public at Croydon aerodrome.

Rear-Admiral Sueter thought Imperial Airways did not replace their machines frequently enough.

Sir Samuel Hoare asked for Air Stamps.

The Under-Secretary of State for Air said that the difficulty with regard to air stamps was the number of small subsidiary post offices and shops. [He might have added that the assistants in these small post offices are so ignorant and inefficient that they do not know the difference between Ulster and the Irish Free State and never by any chance know the postage rates to Palestine, and therefore could not be expected to sell air mail stamps without making a mess of the job.—C. M. MCA.]

He thought the commercial value of an air service from Germany to the West of Ireland was doubtful.

The difficulty of the Calcutta to Singapore section of the Australia route was the monsoons along the Burma coast. [Monsoons as a variation from political problems is something to be thankful for anyhow.—Ed.] The last section was a matter for the Australian Government.

The aeroplanes of any country could use the Baghdad civil aerodrome. The restriction upon the use of aerodromes in India applied equally to British as to Dutch aeroplanes and had been made by the Government of India.

An approved club meant that certain qualifications were necessary before anyone could say that a club was a practical and efficient flying club.

The contract with National Flying Services was that they should provide 20 new aerodromes either themselves or in conjunction with municipalities. The aerodromes provided were municipal aerodromes.

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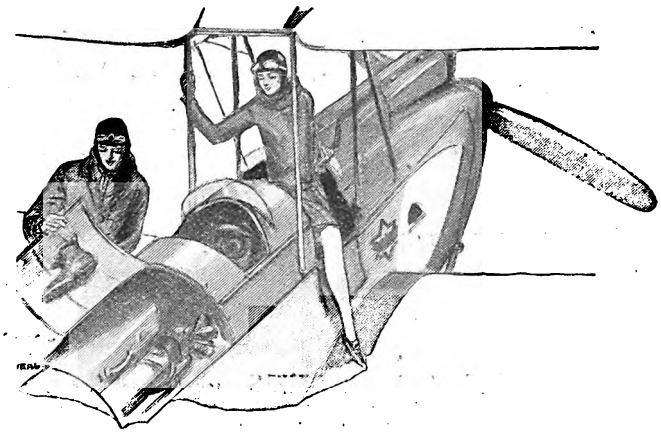

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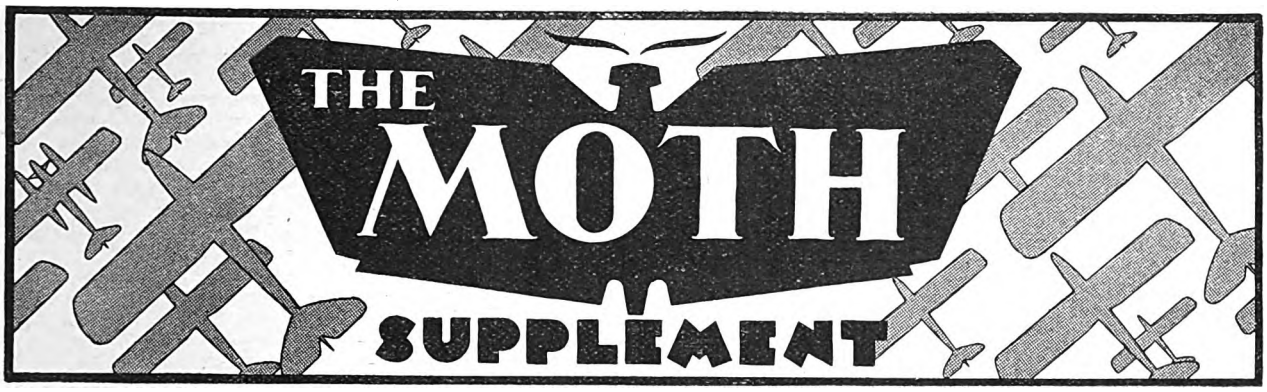

ON DE HAVILLAND HISTORY.

No history of the Moth series of aeroplanes as such would be adequate without some account of the history of the De Havilland Aircraft Co. Ltd. who build the Moth.

Perhaps the most peculiar fact about the De Havilland Co. is that although it is among the youngest of aircraft firms, considered as a firm, it has every right to be considered among the great pioneers of aviation as a collection of individuals. And the board of directors is a most interesting example of the combination of the longest possible experience with youthful energy and driving power.

The firm derives its name from Capt. Geoffrey de Havilland, who actually began to build his first aeroplane in 1908. He made his first flights with it at Highclere, near Newbury, in 1909. When the Army Aircraft Factory came into being at Farnborough Capt. de Havilland, who was already well-known as an able technician in connection with motors, was persuaded by the superintendent of the factory, Mr. Mervyn O'Gorman, to join his staff. While there Capt. de Havilland, who was a Captain in the Reserve of Officers of the Royal Flying Corps, produced several very successful aeroplanes, the most notable of which was the famous B.E. biplane. The initials stood for Blériot Experimental because the Blériot was taken as the prototype of all tractor machines just as the Farman was taken as the prototype of all pushers in the F.E. class.

Capt. de Havilland's B.E. caused considerable excitement at the Military Aeroplane Trials on Salisbury Plain in 1912 by going through all the tests in a way which showed its superiority over all the competing machines, though as a Government product it was *hors concours*. From Capt. de Havilland's B.E. design descended also the S.E. series. And the simple yet unmistakable lines of the B.E. and the S.E. are still recognisable in all the D.H. aeroplane designs which have now reached the astonishing number of eighty in the Moth III which is described in detail in this paper.

Incidentally the distinctive D.H. fuselage-line is very largely responsible for the consistently high performance of all D.H. aircraft.

DE HAVILLANDS IN WAR.

Shortly before the outbreak of War in 1914 Capt. de Havilland was induced by Mr. George Holt Thomas to join him as chief designer of the Aircraft Manufacturing Co. Ltd., Hendon, and there he produced the D.H.1, a two-seat pusher biplane which was an improvement on the F.E. class. This was followed by the D.H.2, a single-seat pusher fighter which did excellent work in the early days of the War; and by the D.H.3, a twin-engined machine which was never fully developed.

Then came the D.H.4, a two-seat general-purpose machine, with a Rolls-Royce Eagle engine, which was one of the greatest aircraft of the War. It had a top speed of over 130 miles an hour, a speed which has only been exceeded in general purpose machines within the last four or five years. Next came the D.H.5, a curious back-staggered single-seater, and the D.H.6, a training machine commonly known as the "Clutching Hand," designed to give the slowest possible speed to simplify the training of pilots.

The next design to become famous was the D.H.9, with the B.H.P. and later with the 240 h.p. Siddeley Puma engine,—a general purpose two-seater with a very fine performance considering its low engine power,—which, when modified in 1918 to take the 400 h.p. American Liberty engine, became World famous, and is to-day still the equipment of some squadrons of the R.A.F.

PEACE-TIME DEVELOPMENT.

Following these came a number of designs and experimental machines which were not put into production and the next number to become famous was the D.H.16, which was in fact a D.H.9a with a cabin to hold four built over the rear cockpit. This was built for Mr. Holt Thomas' firm, Air Transport and Travel Ltd., and was in effect the first British aeroplane put into regular use for civil air transport in 1919 immediately after the War.

The next important product was the D.H.18, an eight-seater cabin machine with a Napier Lion engine, in which the pilot sat behind the cabin. Following this at a distance came the D.H.34, a very similar machine but with the pilot sitting in front of the wings. This type was largely used by Daimler Airways Ltd., which took over the remains of Air Transport and Travel Ltd., when that firm collapsed through being unfortunately in front of its time,—and the D.H.34 was still in use in the early days of Imperial Airways Ltd.

Then came a notable machine, the D.H.37, which was built for the personal use of Mr. Alan Butler who had just joined the firm as Chairman of Directors. Several machines of this type were built for use in Australia.

After this came another quite notable machine, the D.H.50, with which Mr. Alan Cobham made his first flight to Australia and back, and later, as Sir Alan, his first flight to the Cape and back. These have also been used considerably for air-line work in Europe and in Australia.

THE FIRST LIGHT AEROPLANES.

Then came the first of the light aeroplanes, the little D.H.53 with a Bristol Cherub or Douglas or any other twin-cylinder engine. It was a low-wing monoplane built for the Light Aeroplane Competition of 1923, and it had quite a success in the limited market of that period.

Then, after a sequence of other designs, some of which were built experimentally and some of which got no further than the drawing board, came the machine which has made aeronautical history all over the World and has, if one may be allowed to put it that way, made the fortune of the De Havilland Company,—the famous D.H.60 or Moth.

THE MOTHS.

To this series, which now includes the D.H.80 or Moth III, this Supplement of THE AEROPLANE is devoted. Within this

THE BUILDERS OF THE FIRM.—Left to right: Capt. Geoffrey de Havilland, Mr. F. T. Hearle, Mr C. C. Walker, Mr. Alan Butler, Mr. F. E. N. St. Barbe.—(*"Aeroplane" photographs.*)

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series comes the D.H.61, a successful cabin machine with a Jupiter or Jaguar engine, primarily produced for work on the Australian air lines and at first, for that reason, called the Canberra. During last year a machine of this type, baptised *The Youth of Britain*, was used by Sir Alan Cobham in his combined survey and propaganda tour of the British Isles. The type has since been renamed the Giant Moth.

The D.H.80 represents the last word in light aeroplanes to-day. With its inverted engine, its three-seater cabin and its air brakes, and its all-round view, it is not likely to be supplanted as a type by anything better for quite a good while.

Also within this series comes the Tiger-Moth, which is a long way the fastest light aeroplane in the World, as its speed on the straight is close on 200 m.p.h.

Another notable De Havilland aeroplane which must be mentioned is the D.H.66, known as the Hercules, one of the World's most successful three-engined aeroplanes, which with three Jupiters is used on the Imperial Airways route between Egypt and India, and by West Australian Airways.

THE EARLIEST ALLY.

The earliest of Capt. de Havilland's associates was Mr. F. T. Hearle, who worked with him at Highclere in the building of his first aeroplane, and actually flew with him in 1909 as a passenger in the second machine built there on Lord Carnarvon's estate. Mr. Hearle went to the Aircraft Factory with Capt. de Havilland and left there in 1912 to join Mr. Koolhoven and Lieut. John Porte, R.N., in the British Deperdussin Company.

When that firm unfortunately expired he went to the Vickers Aircraft Works at Erith and in 1914 organised for that firm their new Works at Weybridge.

In 1917 he rejoined Capt. de Havilland at the Aircraft Manufacturing Company in charge of the experimental shops and quite naturally he went on with him to the De Havilland Aircraft Company when it was formed in 1921. At first he was Works Manager and a Director, and a year or so ago he was appointed General Manager. The firm's unbroken success is the best evidence of Mr. Hearle's ability.

THE TECHNICAL DIRECTOR.

The Technical Director of the De Havilland Company is Mr. C. C. Walker, who was a civil engineer until he joined the Aircraft Manufacturing Company in 1915. But his connection with aviation goes back to the Dark Ages, for he has the probably unique distinction of having actually left the ground in Sir Hiram Maxim's steam-driven aeroplane, which was somewhere about 1905. When the De Havilland Company was formed Mr. Walker became Technical Director, and still holds that position.

He is regarded throughout the Aircraft Industry as being one of the soundest and most steadily progressive aircraft designers in this country and his influence is largely accountable for the fact that the D.H. design policy has steadily followed that precept of Kipling which says "And keep your light so shining, a little ahead of the rest."

A REINFORCEMENT.

The fourth personality on the Board of Directors of the De Havilland Company who has had direct influence on the production of the Moth is Mr. Alan Butler, the Chairman of Directors. Mr. Butler is a young man who has managed to make a very remarkable career for himself in a very short time. Unlike so many young men who inherit great wealth he is a harder worker than most of the men who are employed by his money, and he spends all his money on promoting employment.

He was only just old enough to be given a commission in the Guards just before the Armistice in 1918. Since then he has been all over the World, and he is qualified navigator at sea and in the air. He navigates his own yacht and he has worked his passage on the Atlantic in a cargo-boat.

By a curious stroke of Fate he paid a visit to the De Havilland Company at Stag Lane somewhere about 1921 just when the firm was going ahead and wanted more capital. He became interested in flying and learned to fly with the De Havilland Company. He became interested in the firm as a firm and put into it the money which it needed for its expansion.

Since then as Chairman of Directors he has consistently pursued a progressive policy in every way. He has developed into an unusually fine pilot and handles De Havilland aircraft of all sorts and sizes with that ease which only comes to a born aviator. And on many occasions he has proved himself to be an exceptionally competent business man.

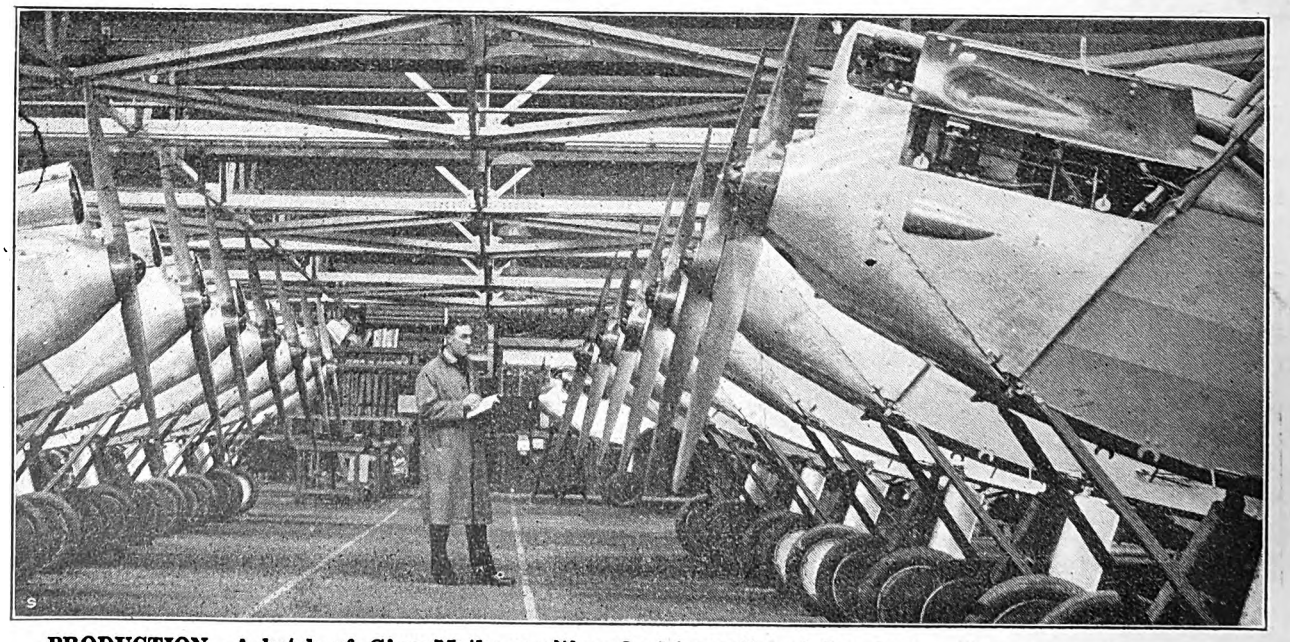
The outstanding success of the De Havilland Company is in no small measure due to the fact that Capt. de Havilland, who is still the firm's chief designer as well as being a pioneer aviator, and Mr. Alan Butler, the Chairman of Directors and a very modern aviator, are both first-class pilots and both continually demonstrate the quality of the firm's products. Such combination is bound to give confidence to the firm's customers.

THE FOUNDER.

In conclusion a word must be said in memory of one whose energy and foresight is largely responsible for the existence of the De Havilland Company. George Holt Thomas, who died on Jan. 1, 1929, was the first business man to recognise the outstanding ability of Capt. Geoffrey de Havilland. To him was due before the War the foundation of the Aircraft Manufacturing Co. Ltd., the greatest aircraft manufacturing concern that has existed in this country up to the present. He also recognised the ability of Mr. Hearle and Mr. Walker, and of Mr. St. Barbe, now the Sales Manager of the De Havilland Company, to whom also is due a large share of the firm's success.

He got together this competent team. And when the De Havilland Company was formed after the Aircraft Manufacturing Company had been wrecked by influences beyond his control Holt Thomas, who had made a great deal of money during the War, helped largely in financing the newborn De Havilland Company by selling at a depreciated price shares with which he had been paid for his holding in the Aircraft Manufacturing Co.

One has his authority for saying that every pound he put into the De Havilland Company cost him £3 of his original wealth. To his memory is due this evidence of his work in founding what is to-day one of the most successful businesses in the British Aircraft Industry.—C. G. G.



PRODUCTION.—A batch of Gipsy-Moths awaiting final inspection at Stag Lane.—(*"Aeroplane" photograph.*)

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THE DEVELOPMENT OF THE D.H. MOTH.

On Mar. 2, 1925, the first D.H.60 or Moth was exhibited to the Press at Stag Lane aerodrome.

The Moth was produced at the time of the first Air Ministry two-seat Light Aeroplane Competition, not to beat rules in the competition, but to provide a two-seat medium light aeroplane capable of fulfilling the practical requirements of the then-to-be-formed Light Aeroplane Clubs and the future private owner.

The 1924 Air Ministry Competition was actually designed with these points in view but as with all competitions run under complicated rules, the competing aircraft were designed rather to win the competition than to achieve the ideal aimed at.

Capt. de Havilland felt he could do more for Aviation by ignoring the competition and its resultant prize money and publicity and by producing an aeroplane which would possess the qualities desired, and fulfil the ultimate requirements of the two-seat light aeroplane. How successful his foresightedness proved is to be seen in the amazing progress and success of the Moth over a period of five years.

Capt. de Havilland realised that the most desirable type of machine was one that would provide elementary and intermediate training under conditions that would rule out the use of light freak aircraft and engines, suitable only for good aerodromes, fine weather, and experienced pilots.

This called for a simple and cheap but at the same time robust structure and the use of an engine with the simplicity of a car or motor-cycle power-plant, and with an adequate reserve of power. An engine of this type did not exist at the time but in collaboration with Major F. B. Halford, Capt. de Havilland drew up a specification for an engine which would conform to his requirements as the aircraft designer.

The result of this collaboration was the first Cirrus engine, which was built by A.D.C. Aircraft Ltd. To A.D.C. Aircraft Ltd., therefore, as well as the De Havilland Aircraft Co. Ltd., must be given the credit for the introduction of a type of aircraft which has since become one of the most popular and most useful all over the World.

THE MOTH MARK I.

In general arrangement and appearance the first Moth differed very little from the type which is flying to-day. It was built all of wood and it had the first 27/60 h.p. A.D.C. Cirrus Mk. I four-cylinder in-line engine, which was designed for this type of aircraft.

The price of the first model was £885, or £902 15s. complete with dual ignition,— which later became standardised.

Early in 1925 the Flying Club movement was inaugurated in England and the first five Clubs—London, Midland, Lancashire, Newcastle-upon-Tyne and Yorkshire—were equipped with the D.H. Moth.

The first noteworthy performance of the Moth was a flight, by Mr. A. J. Cobham, from London to Zurich and back, a distance of 1,000 miles, in 14 hours, on May 29, 1925. This demonstration resulted in the London press dubbing the Moth "the most practical and successful light aeroplane which the World has so far seen."

By the end of 1915 the De Havilland Company had settled down to turn out Moths as a production job. Besides the batch which were built for the Flying Clubs, two Moths were built for the Air Ministry and were sent to the Central Flying School. Also an order was placed by the Australian Government for two Moths, to be delivered to the Royal Australian Air Force, so as to test the possibilities of the Moth as a Service training machine.

Early in 1926 the Moth was adopted as the standard equipment for the Australian Light Aeroplane Clubs, which were established under a scheme similar to that operating in England.

During the 1926 General Strike a number of Moths were suddenly called upon to do general transportation work alongside aircraft of normal size. And between May 6 and May 18 seven Moths flew 15,275 miles on work of national importance without any trouble whatsoever,—which is interesting and impressive.

On July 9-10, 1926, the Moth Mk. I scored its first big success when it won the King's Cup Race round Great Britain at an average speed of 90.4 m.p.h. for the total distance of 1,480 miles,—piloted by Mr. H. S. Broad.

On Aug. 18 the price of the Mk. I Moth was reduced to £795, complete with all equipment.

THE MOTH MARK II.

In the Autumn of 1926 the Cirrus Mk. II engine passed its type-tests and this engine, which was rated at 30/80 h.p., became available as a power plant for the Moth. The increased power made possible the development of the Moth as a seaplane, a further step in its gradually increasing usefulness.

Short Bros. Ltd., of Rochester, already famous for sixteen years as makers of float seaplanes, produced a special set of duralumin floats for the Moth, and these have been the standard float gear for the Moth ever since.

On Jan. 1, 1927, the price of the Moth was again reduced, —this time to £730. This Moth was known as the Mark II and was fitted with the 30/80 h.p. Cirrus II engine.

Before passing to this new type we must record an extraordinary courageous flight in two Mark I Moths with Cirrus II engines by Mr. Neville Stack and Mr. Bernard Leete, from England to India, between Nov. 15, 1926, and Jan. 8, 1927,—the first flight out of Europe by a light aeroplane.

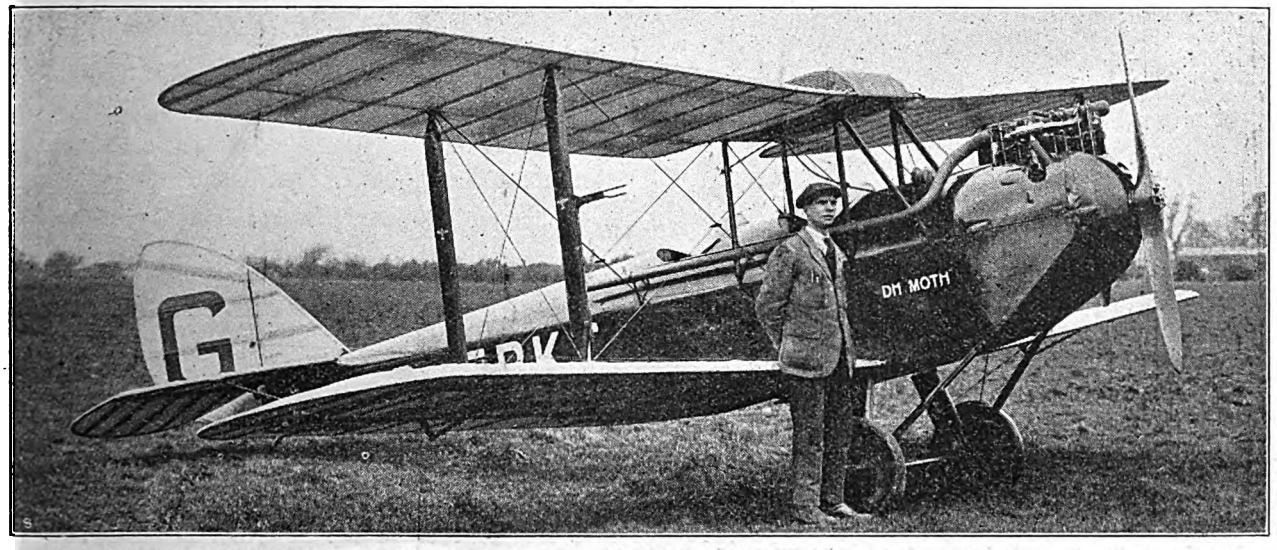
Mr. Stack flew the machine with which Mr. Broad won the 1926 King's Cup Race, and Mr. Leete flew the second Moth ever built,—so both machines had previously done a considerable amount of flying. Both had been fitted with new Cirrus II engines, and had been converted to single-seaters, so as to carry more petrol.

This flight proved the value of the Moth as a machine capable of tackling the most strenuous possible flying.

THE FIRST OVERSEAS BRANCH.

On Feb. 7, 1927, Major Hereward de Havilland, the brother of the founder of the firm, arrived in Australia to open an Australian branch of the De Havilland Company. He landed at Perth with a Moth of the newest type. The machine was erected there, and on Feb. 24 he left Perth and flew across Australia to Melbourne, where he arrived on Feb. 28, after covering the distance of 2,000 miles at an average speed of 70 m.p.h. against a constant head wind.

Thus was inaugurated the first overseas branch of the company, The De Havilland Aircraft Proprietary, Ltd., under the able management of Major de Havilland, has reproduced in Australia the extraordinary success of the parent company at home.



THE VERY FIRST MOTH.—The first Moth with the Cirrus Mk. I engine which made its first public appearance in March, 1925.

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THE MOTH X.

In July 1927 the De Havilland Company announced the production of the Moth X, which was a still further improved version of the original Moth. The improvements were based on 2½ years' and 1,000,000 miles' experience with this type.

The principal structural modifications in the new type were the lowering of the thrust-line of the engine (which improved the cowling lines and the forward view and lessened the frontal area) and the increasing of the span and gap.

The first accomplishment of the Moth X was a World's Height Record for two-seat Light Aeroplanes weighing less than 400 kgs. (850 lbs.). This was put up on July 8 by the Hon. Lady Bailey, who was accompanied by Mrs. de Havilland as passenger. They reached a height of 5,268 m (17,283 ft.).

On July 30 the Moth scored its second consecutive victory in the King's Cup Race, when Mr. W. L. Hope, founder and manager of Air Taxis, Ltd., covered the course of 540 miles at an average speed of 92.8 m.p.h.

His machine was a two-year-old Moth, Mk. I, with a 27/60 h.p. Cirrus I engine, which had previously flown 75,000 miles in training, touring, photography, and taxi-flying thereby proving most convincingly its reliability.

On Sept. 1 Lieut. R. R. Bentley, M.C., S.A.A.F., left Croydon in a Moth with a Cirrus II engine and in 28 days and 100 hours' flying time reached Cape Town, a distance of 8,000 miles. This was the longest solo flight made up to that time, and it proved once again the extreme practicability of the Moth. For this flight Mr. Bentley was awarded the Britannia Trophy for 1927.

Early in 1928 the Royal Australian Air Force announced that it had decided to replace its standard heavy type training plane by the Moth. This decision was reached as the result of tests made with the two Moths supplied to the R.A.A.F. at the end of 1925. A first order for twelve was placed through the Australian branch company,—De Havilland Aircraft Proprietary Ltd.

By this time the production of the Moth in England had reached one a day. Included in the business of 1928 was one order for twenty Moths for the use of the Communication Squadrons of the R.A.F.

In February a further reduction in the price of the Moth, this time to £650, was announced.

On March 1, 1928, the De Havilland Aircraft of Canada, Ltd., the second of the D.H. associated companies, was formed in Toronto to act as a distributing and service centre for D.H. aircraft in Canada.

On March 19 a demonstration of the Moth fitted with the Handley Page automatic slot was given at Stag Lane. This demonstration showed what can be done to reduce the dangers of errors of judgment in flying.

As a result the automatic slot was made an optional accessory to the Moth, and the price of this machine so fitted was fixed at £685.

The combination of the slot with the balanced and powerful controls of the Moth produced a very great advance in the direction of the fool-proof aeroplane.

To cope with the additional stresses likely to be imposed on the machine and to provide a wider and serviceable base for landing in rough country the Moth was fitted with a new divided undercarriage with a wider track, and this has been the standard type for the Moth ever since.

MORE TRIUMPHS OVERSEAS.

The Aero Club of India and Burma was formed in March 1927. This body organised four Flying Clubs to operate under a subsidy scheme similar to those already operating in other parts of the Empire. In 1928 this club decided to make the Moth its standard type, and twelve were ordered.

In April 1927 the New Zealand Government announced its support for a Flying Club scheme and at the same time it adopted the Moth as a training machine for the New Zealand Air Force. Eight Moths were ordered, four for the two proposed clubs and four for the N.Z. Air Force.

On May 12 Lieut. R. R. Bentley arrived back at Croydon from Cape Town, this time with his wife as passenger. He left Cape Town on Feb. 20, and by the time he had arrived at Croydon his Cirrus-Moth had covered 25,000 miles without any trouble whatever.

This flight, taken in conjunction with his London-Cape Town flight between Sept. 1 and Sept. 28, made Mr. Bentley the first pilot to fly from London to Cape Town and back to London in a light aeroplane, and he was also the first pilot to do the journey in either direction with a passenger.

One of the first foreign nations to realise the qualities of the Moth as a training machine was Chile. In May 1928 that country announced that it had decided to equip its Army Air Force with Moths.

In June 1928 a firm known as the Moth Aircraft Corporation was incorporated in the U.S.A. to manufacture the D.H. Moth under licence. This company has since been absorbed with the Curtiss-Wright aviation group, the most powerful aricraft manufacturing organisation in the United States, and the Moth is now in full production in the States.

THE THIRD KING'S CUP.

On July 20-21 the Moth scored its third consecutive victory in the King's Cup Race round Great Britain. In this same race Moths were also placed third, fourth, fifth, sixth, seventh, eleventh, and twelfth.

Miss Winifred Spooner, who finished in third place, won the Siddeley Trophy for being the first Club-trained pilot in a light aeroplane to complete the King's Cup Course, besides being the first woman to score a place in this race.

Mr. W. L. Hope won this race of 1,100 miles at an average speed of 100.75 m.p.h. flying a Moth fitted with the new D.H. Gipsy engine. This was the first public appearance of this new engine in a big event and the fact that it completed the two-days' full-throttle flying over the 1,100 mile course without any trouble marked it as thoroughly sound.

THE MOTH G.

The Gipsy engine, which was the joint product of the exceptional experiences of Capt. de Havilland and Major Halford, the designer of the Cirrus engine, had been in process of development for a year. During this time, it put up a World's Speed Record of 186 miles an hour in the little racing Tiger-Moth (piloted by Mr. Broad) as a "boosted" engine,—in which condition it had been originally produced. For production purposes this racing engine after a long period of test was de-tuned from 135 h.p. to a nominal 100 h.p. by reducing the compression ratio and by fitting smaller valves. This engine was adopted as a standard type and the resulting machine was called the Gipsy-Moth or Moth G.

THE USES OF ADVERTISEMENT.—A Gipsy-Moth coupé seaplane, with coupé top removed for summer flying, belonging to a Flying Club in N.W. Finland. This demonstrates one way of making advertising pay for flying.

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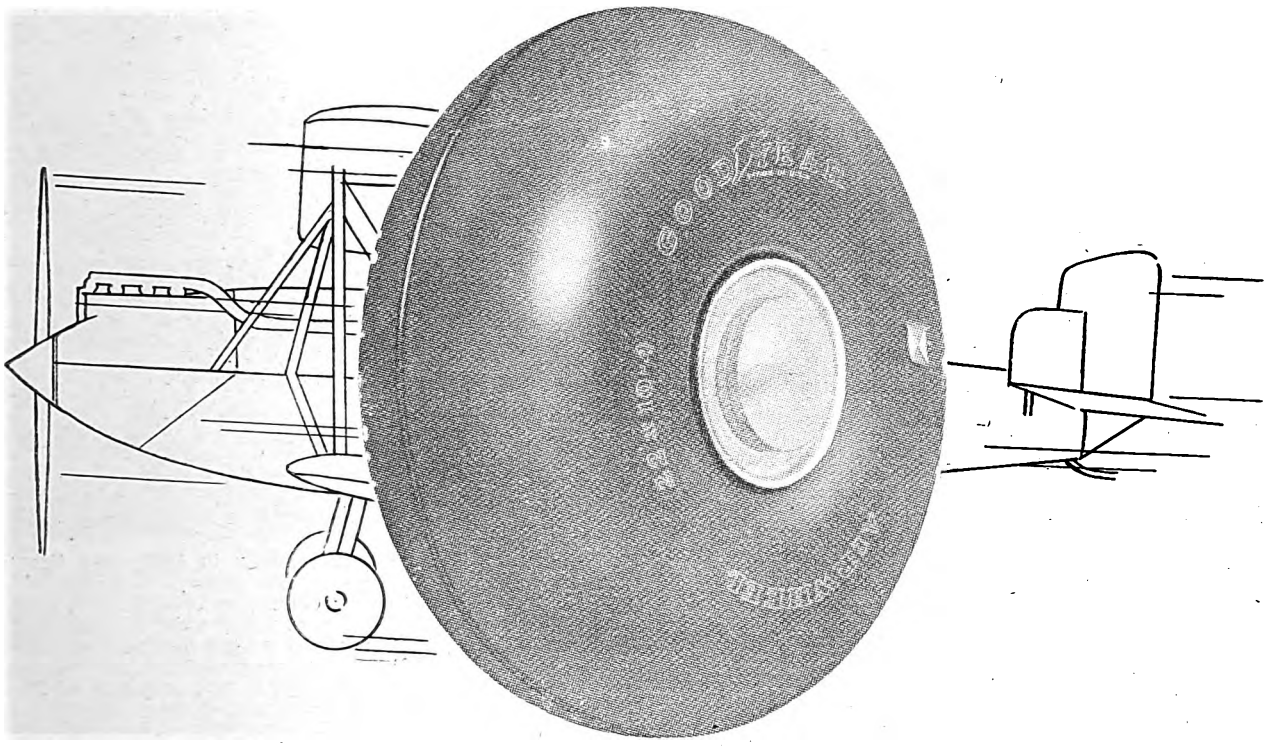

The GOODYEAR Air Wheel

Since the beginning of flight, aeroplanes have used tyres adapted from the motor car—an entirely different type of service. Now for the first time, the aeroplane has a tyre of its own, conceived and built for the specific purpose of cushioning several thousand pounds of weight, as it leaves or meets the ground at express train speed.

This Goodyear Air Wheel cushions a take-off or landing as no tyre has ever been able to do before.

All the usual wheel failures are eliminated for the simple reason that there are no wheels. The Air Wheel and its tube are mounted directly on the hub.

It is simply a big, soft, air-filled, rubber cushion, literally a wheel of air. There is reason to believe that this Goodyear development will render any other type of shock absorber needless.

From the first landing impact Air Wheels keep the plane in gentle contact with the ground. There is neither bouncing nor pitching.

Landings have been tried with one Air wheel deflated, and the loss of radial distance proved almost negligible. In landing with a deflated Air Wheel the tyre takes the greater share of the strain and serves as a cushion. Meanwhile, the hub is permitted to turn without hindrance, providing a rolling contact with the ground, regardless of the condition of the Air Wheel.

For the present this Air Wheel is manufactured only in U.S.A.

For further particulars write to:

The Goodyear Tyre & Rubber Company (Great Britain) Limited, Wolverhampton

GOODYEAR

Factories in: England, Australia, Canada and United States

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Mr. H. S. Broad and the Tiger-Moth in which he put up a World's Speed Record for Light Aeroplanes of 187 m.p.hr. (300 km.p.hr.).
—(*"Aeroplane" photograph.*)

Following on the success of the Gipsy-Moth in the King's Cup Race on July 26, Capt. de Havilland, with Mrs. de Havilland as passenger in a Gipsy-Moth, put up the World's Height Record for two-seat Light Aeroplanes weighing less than 400 kgs. (880 lbs.) to a height of 19,857 feet.

In August the Danish Government's decision to adopt the Gipsy-Moth as the standard service training aircraft for the Air Services was announced. A preliminary order for eight was placed with the De Havilland Company.

On Dec. 7 Mr. A. S. Butler, the Chairman of the firm, with Mrs. Butler as passenger, in a Gipsy-Moth put up a World's Speed Record for Light Aeroplanes by covering 100 kilometres at an average speed of 192.864 km.p.h. (119.84 m.p.h.).

LADY BAILEY'S TOUR.

In January, 1929, the Hon. Lady Bailey arrived back at Stag Lane in her Cirrus-Moth after completing the greatest flight ever achieved in a light aeroplane by any pilot of either sex, and the greatest flight by any pilot flying alone.

She left Stag Lane on Mar. 9 to fly to South Africa and on April 30 she reached Cape Town, flying by way of France, Italy, North Africa, Egypt, Kenya and Rhodesia.

On Sept. 20 she left Cape Town to return to England, and, as she could not get permission to fly over the Southern Soudan section of the route without escort, she decided to go round by the West Coast of Africa and return that way. She arrived back at Stag Lane on Jan. 16, 1929, after having made a voyage of approximately 18,000 miles all by herself.

MR. BENTLEY AGAIN.

Also in 1929 Mr. Bentley completed his second England-Africa-and-return flight, also in a Moth with the 85/95 h.p. Cirrus III engine.

He flew from England to Cape Town between Oct. 19 and Dec. 22, 1928, with Mrs. Bentley as passenger. On July 10, 1929, he left Johannesburg with an American business man on a charter flight to Berlin, and thence he flew to London, where he arrived on Aug. 26.

Mr. Bentley is the only pilot to have made four flights between England and South Africa. The total distance of approximately 32,000 miles was flown in the same Moth, G-EBSO, in which he made the first flight by a light aeroplane to South Africa.

MORE PUBLIC TRIUMPHS.

In the 1929 King's Cup Race sixteen Gipsy-Moths started and of these fourteen finished. In the race for the King's Cup Moths finished second, third, fourth and fifth, and in the contest for the Siddeley Trophy which was run in conjunction with the King's Cup Race Moths finished first, second, third, fourth, fifth and sixth.

The Moth was only beaten for first place by a Gloster Grebe with an engine of four times the power of the Gipsy. And though two Moths in the race retired neither of them did so because of mechanical trouble.

Two other notable achievements in 1929 were the winning of the first prize in the Heavy Category of the *Challenge Internationale de Tourisme* (The Tour of Europe), in competition with aircraft of many other nations, and the winning of the Coupe Zenith for light aircraft. In winning this Trophy the Gipsy-Moth, carrying pilot and passenger, with a perfectly standard engine, flew a circuit of France with five compulsory stops at an average speed of 112.5 m.p.h. Mr. Hubert Broad was the pilot in each event.

During 1929 the production of the Gipsy-Moth reached nearly three a day, and even then at times production could not keep pace with the demand. In the month of January alone 60 Moths were delivered to their buyers; a remarkable exposition of the popularity of this type,—which is the first British civil aircraft to be turned out in quantities.

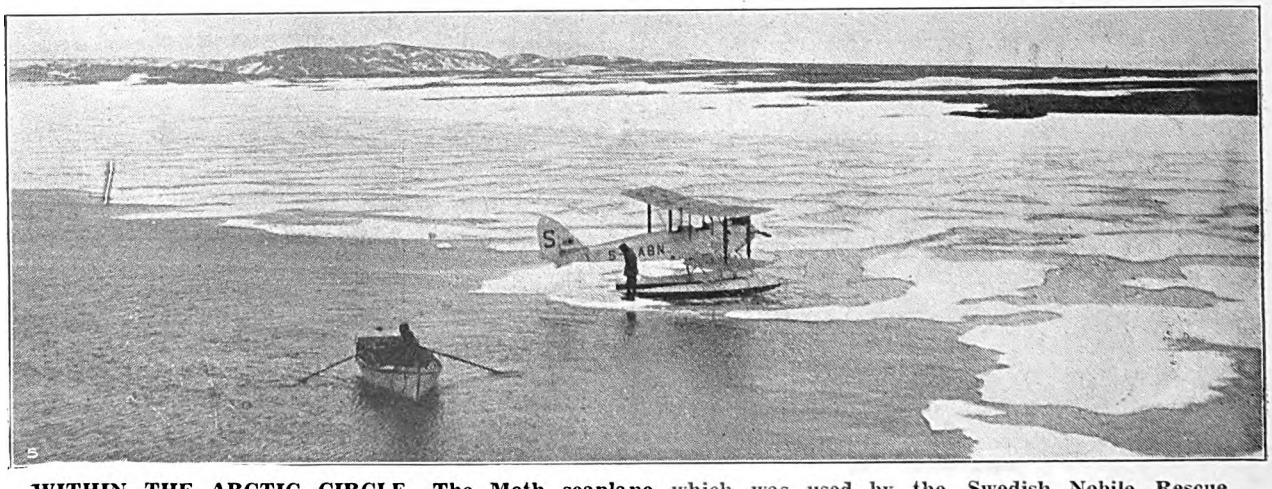
UNIVERSALITY.

By the end of the year 1929 Moths were being used as the standard training machine by the following Flying Services:—The Royal Air Force, The Royal Australian Air Force, The Royal Canadian Air Force, the South African Air Force, The New Zealand Air Force, The Irish Free State Air Force, the Chilean Military Air Force, the Italian Regia Aeronautica, the Royal Danish Army and Navy Air Services, the Greek Naval Air Service, the U.S. Army and Navy Air Services, the Portuguese Naval Air Service, the Royal Roumanian Air Service, the Royal Yugo-Slavian Naval Air Service, and the Spanish Army Air Service.

Practically every Flying Club in the British Empire was using Moths and other countries which have followed our example in the establishment of Flying Clubs have also chosen the type of machine that has proved its worth as a training machine Thus there are Flying Clubs useing Moths in Finland, Sweden, Switzerland, Portuguese East Africa, U.S.A., Yugo-Slavia and Italy, to mention but a few.

Private owners all over the World continually express their complete satisfaction with the performance and capabilities of the Moth and the Gipsy Engine.

Commercial companies are using the Moth for mail and light transport, air photography, survey, passenger carrying, instruction, etc. And, judging from the satisfaction given, there seems to be no limit to the usefulness of this amazing aeroplane.



WITHIN THE ARCTIC CIRCLE.—The Moth seaplane which was used by the Swedish Nobile Rescue Expedition in Spitzbergen in 1928. This machine rescued Capt. Lundborg under difficult conditions.

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THE D.H. GIPSY MOTH.

The latest version of the Gipsy-Moth is of the metal-fuselage type. This is now produced in two distinct versions, one with the standard Gipsy I engine of 85/100 h.p. and the other with the new Gipsy II engine of 100/120 h.p. The following description covers both types. Where they differ due reference will be made.

Wings.

The Gipsy-Moth is a single bay biplane with wooden wings, which fold by hingeing the rear spar fittings. The standard Gipsy-Moth has wings of Raf.-15 section, but the model with the Gipsy II engine has a section known as the R.A.F. Training section, which is particularly applicable to machines required for advanced training and aerobatics.

Both types of wings are built up of spindled spruce spars, spruce and plywood ribs, and steel tube drift-struts, and are covered with fabric. The top wings are attached to a centre-section, which is carried above the fuselage by steel tube struts so arranged that no side-bracing interferes with access to the front cockpit.

Interplane struts are of spruce and the wings are braced with streamline wires. Ailerons are mounted on the bottom planes only and are operated by the well-known D.H. differential control. Handley Page automatic slots, when fitted, are on the top planes.

Fuselage.

The fuselage is built up of two welded steel tube sides and all the welded joints are reinforced with flat steel plate joints. The two sides are assembled together by cross-tubes bolted to the side-frames and the rear section of the fuselage is braced with duplicated steel wire and turn-buckles.

The domed deck of the fuselage is a plywood structure and the whole is covered with fabric, which is supported on the sides by wooden stringers.

Tail Unit.

The tail of the Moth is a wooden framework covered with fabric. The tail-plane can be adjusted on the ground and a spring elevator-control maintains longitudinal trim in the air. This is operated by a lever in the pilot's cockpit, and thus the elevators can be spring-loaded to any required degree to allow the machine to be flown "hands off" at all speeds and throttle-settings and with varying dispositions of load.

Undercarriage.

The undercarriage is of the split type and consists of two spring-legs with rubber-in-compression springing and Ferodo clamping, the bottom ends of which are hinged by two short bent axles to a stayed steel-tube Vee under the fuselage. The spring-legs are braced by two radius-rods running forward to the base of the fire-proof bulkhead. All the necessary joints have ample bearing surfaces and "Tecalemit" greasing nipples.

The tail-skid is of the steerable type, and shocks are taken by a steel coil-spring. The skid is shod with an easily renewable manganese-steel shoe. The wheel undercarriage may be replaced by a pair of Short all-metal floats, or the wheels may be changed for skis.

Power Plant.

Either the 85/100 h.p. Gipsy I or 100/120 h.p. Gipsy II engine is installed. The engine is mounted on rubber blocks clamped within steel housings directly on the side-frames of the fuselage. The engine is almost completely encowled and it is cooled by a scoop on the right side, which directs the airflow evenly round the four cylinders.

Fuel is carried in a tank in the centre-section, and petrol is fed by gravity through copper tubing to a large filter on the fire-proof bulkhead and thence by flexible tubing to the carburetter. Oil is carried in the sump of the engine.

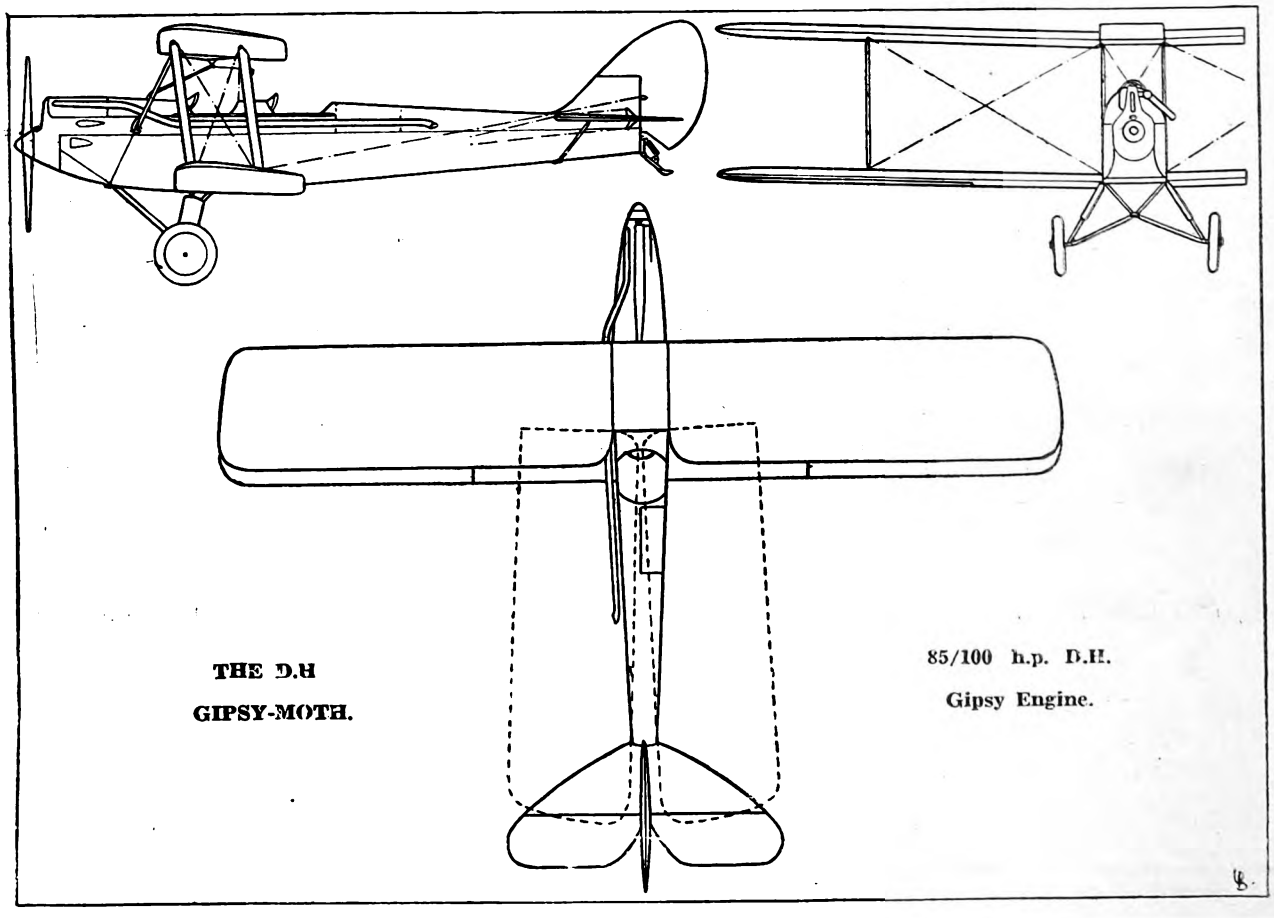
Accommodation.

The crew of two is accommodated in tandem open cockpits. The dual controls are mounted in a complete unit in a box which passes through each cock-pit. The front control-column and rudder-bar may be removed if the machine is not wanted for dual training.

No pulleys are used in the control-system but all turns are worked by levers and all pivots work on well-greased ball-races. Where cables are used they are straight. Rudder-bars have adjustable pedals. Aileron control is on the well-known D.H. differential system, and the elevator control incorporates a spring-loaded device for maintaining longitudinal trim under all conditions of load and speed.

A very complete set of instruments, on a Smith unit dash-board, is fitted in the pilot's cockpit. In the training type this is augmented by a turn-indicator and a Hughes Mk. IIIa aperiodic compass. Cockpits in both types are comfortable and free from draughts. Parachute seats and Sutton harness for advanced aerobatics are standard in the training type.

Where additional comfort is needed a special coupé top may be supplied as standard, or may be bought as a separate



THE D.H GIPSY-MOTH.

85/100 h.p. D.H. Gipsy Engine.

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SKF Means the Right Bearing in the Right Place

STANDARDISED FOR THE MOTH

The de Havilland Aircraft Co., Ltd., have standardised SKF Ball Bearings for their famous MOTH Light Aeroplane and Gipsy Engines since its introduction. SKF Bearings have played their part in the many records which the Moth has gained, including the World's Speed Record for 2-seater Light Aeroplanes, the World's Altitude Record (4 miles high, the World's Endurance Record (24 hours in the air) and the King's Cup Race.

SKF Bearings are made from the highest quality carbon chrome steel—*hardened throughout*—and are designed and constructed to give a long life of unfailing performance.

The SKF Organisation, as the World's largest manufacturers of Ball and Roller Bearings, is in a unique position to render technical advisory Service to the Aircraft designer, and such service is gladly offered, without obligation.

The Moth Aeroplane and SKF Bearings are both in world-wide service. There is an SKF Branch Office in ever important town of both hemispheres, carrying stocks of of SKF Bearings as used in MOTH components.

SKF BALL BEARINGS

THE SKEFKO BALL BEARING CO., LTD.,
HEAD OFFICE & FACTORY: LUTON, BEDS.

OTHER SKF FACTORIES IN SWEDEN, FRANCE, GERMANY, CZECHO-SLOVAKIA, RUSSIA AND THE U.S.A.

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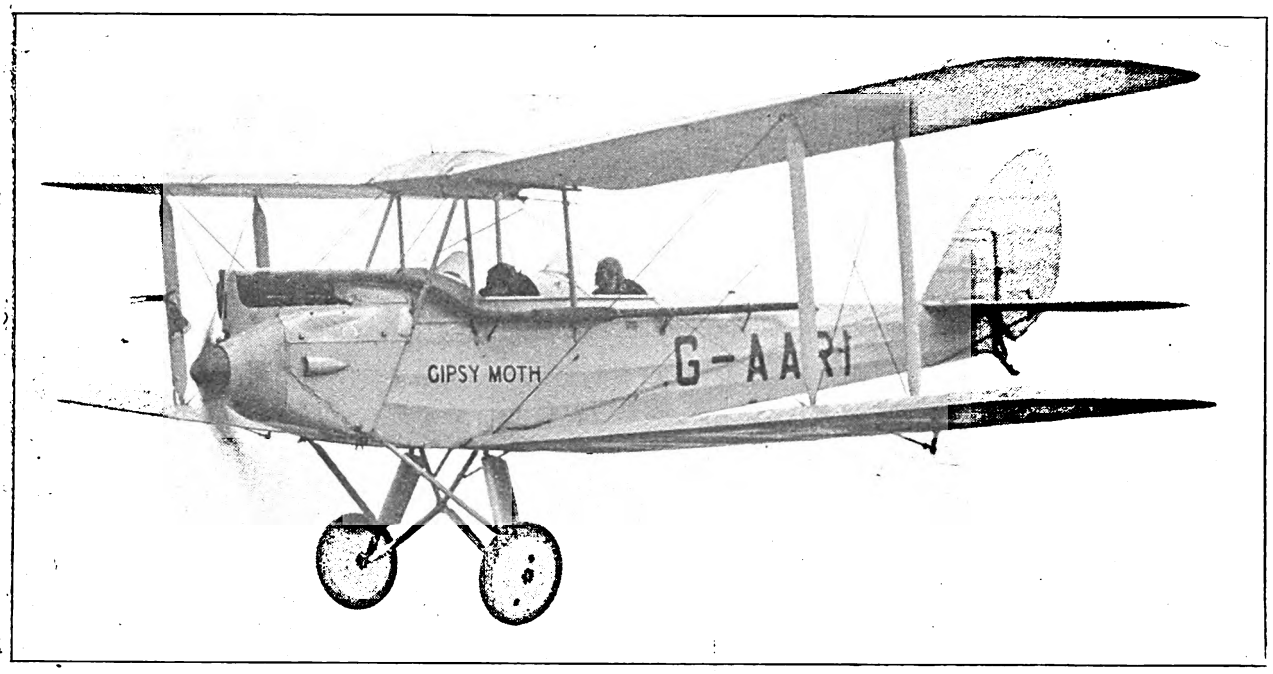


THE STANDARD MODEL.—A standard Gipsy-Moth with the 85/100 h.p. Gipsy I engine.—(*"Aeroplane" photograph.*)

unit for attachment to any standard Moth. This top makes the use of special flying clothing unnecessary.

For use in cold climates a special cock-pit heater may be incorporated.

The performance of the Coupé Moth is slightly superior to that of the standard type because the covering gives a better streamline than the open type, which causes eddies round the windscreens and cock-pit openings.

SPECIFICATION.

LANDPLANE (85/100 H.P. GIPSY I ENGINE).

DIMENSIONS.—Span 30 ft. (9.15 m.), Length 23 ft. 11 in. (7.3 m.), Height 8 ft. 9½ in. (2.68 m.), Width folded 9 ft. 10 in. (3 m.).

WEIGHTS.—Weight empty 900 lbs. (408 kgs.), Crew 320 lbs. (145 kgs.), Petrol and oil 159 lbs. (72 kgs.), Baggage, etc., 371 lbs. (168 kgs.), Weight loaded (normal C. of A.) 1,750 lbs. (793 kgs.), Weight loaded (Aerobatic C. of A.) 1,550 lbs. (703 kgs.).

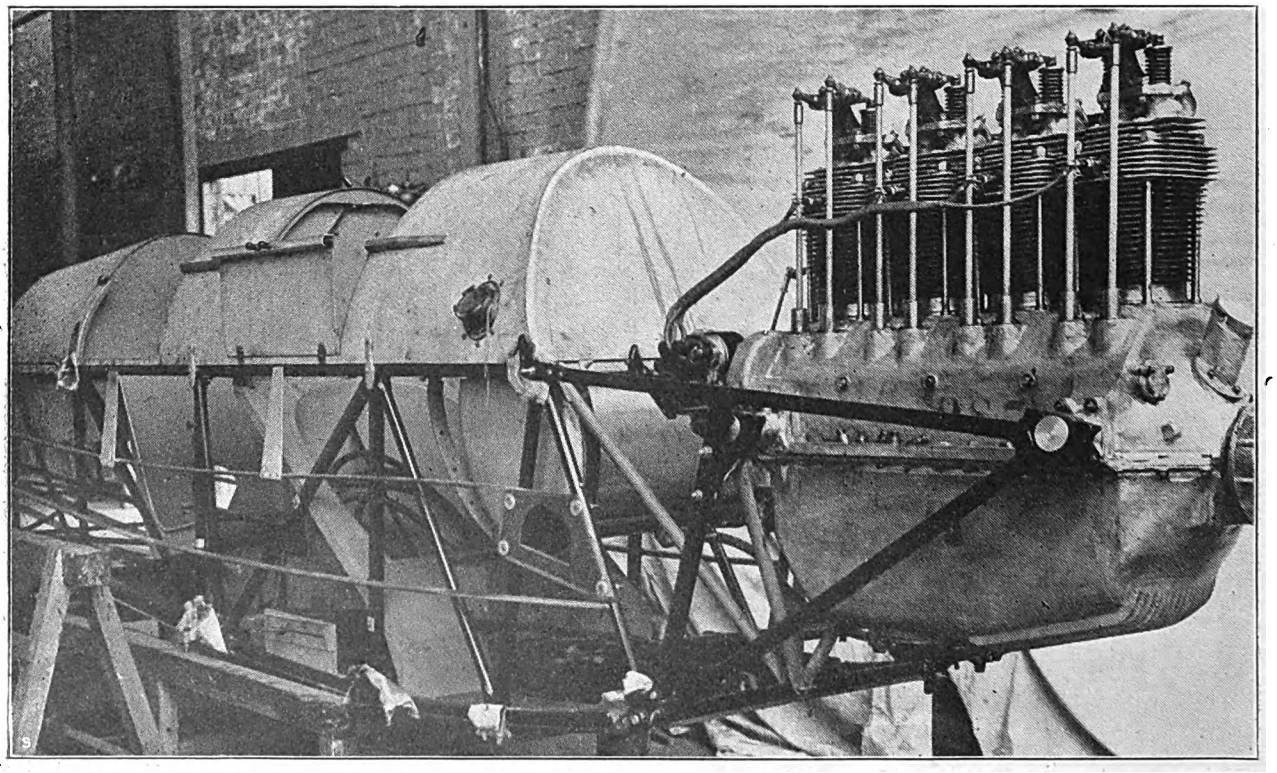
PERFORMANCE.—(1,650 lbs.—748 kgs.): Speed, max., 102 m.p.h. (164 km.p.h.), Speed at 5,000 ft. (1,525 m.) 97 m.p.h. (156 km.p.h.), Cruising speed at 1,000 ft. (305 m.) 80-85 m.p.h. (129.136 km.p.h.), Stalling speed 45 m.p.h. (72 km.p.h.), Initial rate of climb 500 ft./min. (153 m./min.), Climb to 5,000 ft. (1,525 m.) 13 mins., Climb to 10,000 ft. (3,050 m.) 35 mins., Absolute ceiling 14,500 ft. (4,420 m.).

SEAPLANE (85/100 H.P. GIPSY I ENGINE).

DIMENSIONS.—Span 30 ft. (9.15 m.), Length 24 ft. 10 in. (7.59 m.), Height 10 ft. 1½ in. (3.09 m.), Height above water-line 9 ft. 2¼ in. (2.81 m.).

WEIGHTS.—Weight empty 1,015 lbs. (462 kgs.), Crew 320 lbs. (145 kgs.), Petrol and oil 159 lbs. (72 kgs.), Baggage, etc., 256 lbs. (114 kgs.), Weight loaded (normal C. of A.) 1,750 lbs. (793 kgs.), Weight loaded (Aerobatic C. of A.) 1,550 lbs. (703 kgs.).

PERFORMANCE.—Speed, max., 98 m.p.h. (158 km.p.h.), Speed at 5,000 ft. (1,525 m.) 92 m.p.h. (148 km.p.h.), Cruising speed at 1,000 ft. (305 m.) 75-80 m.p.h. (120-129 km.p.h.), Stalling speed 43 m.p.h. (69 km.p.h.), Initial rate of climb 480 ft./min. (164 m./min.), Climb to 5,000 ft. (1,525 m.) 14 mins., Climb to 10,000 ft. (3,050 m.) 40 mins., Absolute ceiling 13,000 ft. (3,960 m.).



THE POWER UNIT.—The mounting of the Gipsy I engine in the Moth fuselage.—(*"Aeroplane" photograph.*)

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THE D.H. MOTH-THREE.

THE LATEST MOTH.—The first produ tion Moth-Three flying over Edgware.—(*" Aeroplane " photograph.*)

The latest development of the De Havilland Aircraft Co. Ltd. is a two-, or occasional three-, seat enclosed cabin light monoplane known as the D.H.80 or Moth-Three.

This machine has not been designed as a replacement for the now World-famous Gipsy-Moth, but as a completely new type to provide a comfortable and fast cabin aeroplane to fill the requirements of those private owners and other users who desire something more luxurious than the standard open cockpit biplane, and a higher performance.

The Moth-Three is intended to be normally a two-seater, but the cabin is wide enough aft to take two passengers in slightly staggered seats. An ingenious arrangement of seats and controls is provided to allow the machine to be used as a two-seater with dual control or a three-seater with the pilot in front.

The problem of good vision has been given special attention in this machine and the view provided is the best to be had with this type of aircraft. It is far superior to that provided by any single-engined cabin machine that has yet been built.

The Moth-Three has for its power plant the new inverted Gipsy III engine, a description of which appears elsewhere.

Wings.

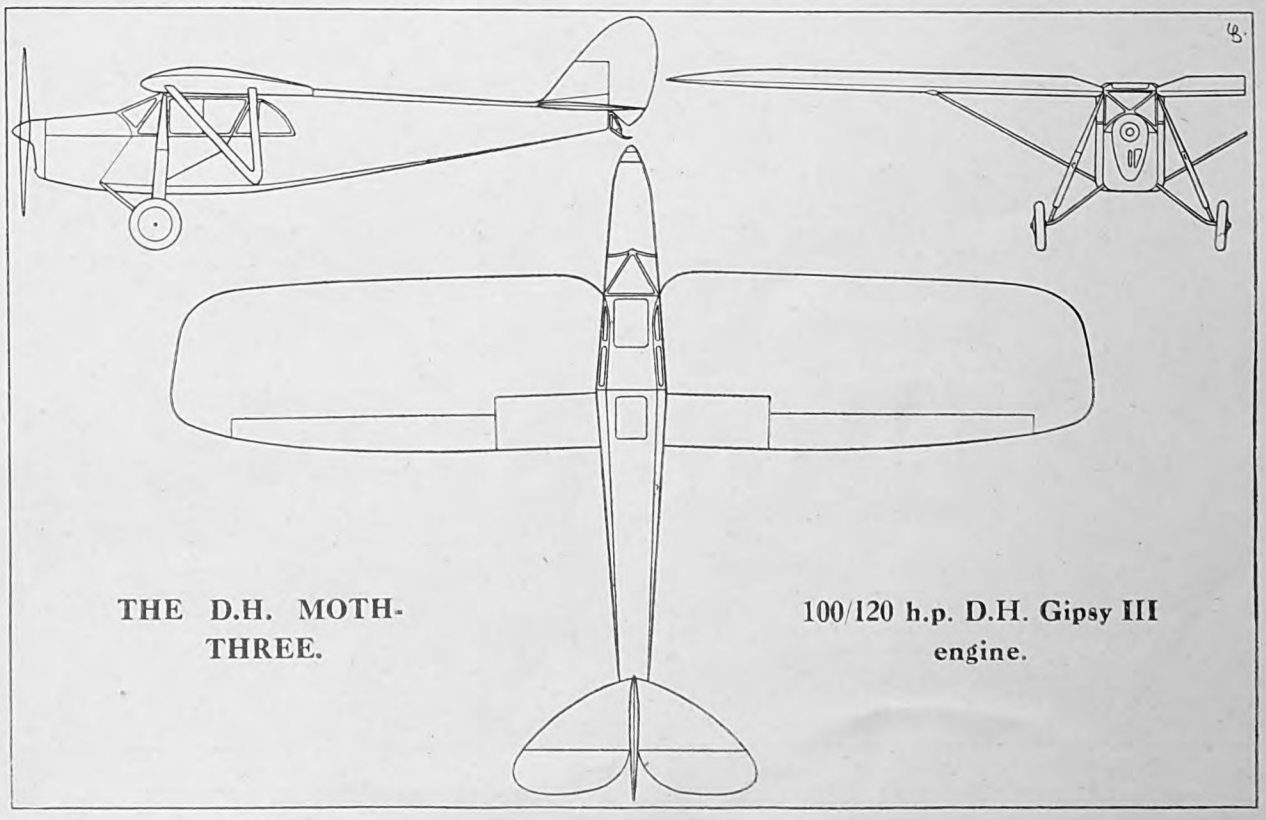
The wings are of the high-wing, rigidly-braced type and are arranged to fold round the rear-spar joints.

They are of all-wood construction, of the usual D.H. type and are covered with fabric. The wing-roots are tapered in thickness to their points of attachment to the fuselage so as to make as little blind surface as possible for the occupants of the cabin.

These roots are attached to the top fuselage longerons by two fittings, the front one a locking-joint and the rear one a hinge-joint.

The wings are braced to the bottom fuselage longerons by two Vees of streamline steel tube, the apices of which are at points directly below the rear-spar hinges, so that the wings may be folded without interfering with the wing-bracing.

A small jury strut is carried on either side of the fuselage, which can be swung up and attached to the front-spar fitting when the wing is folded to take the weight of the front corner of the wing. This is only a precaution to guard against possible damage in the event of the machine being man-handled over rough ground in a folded condition when the wing-tanks are full.



THE D.H. MOTH-THREE.

100/120 h.p. D.H. Gipsy III engine.

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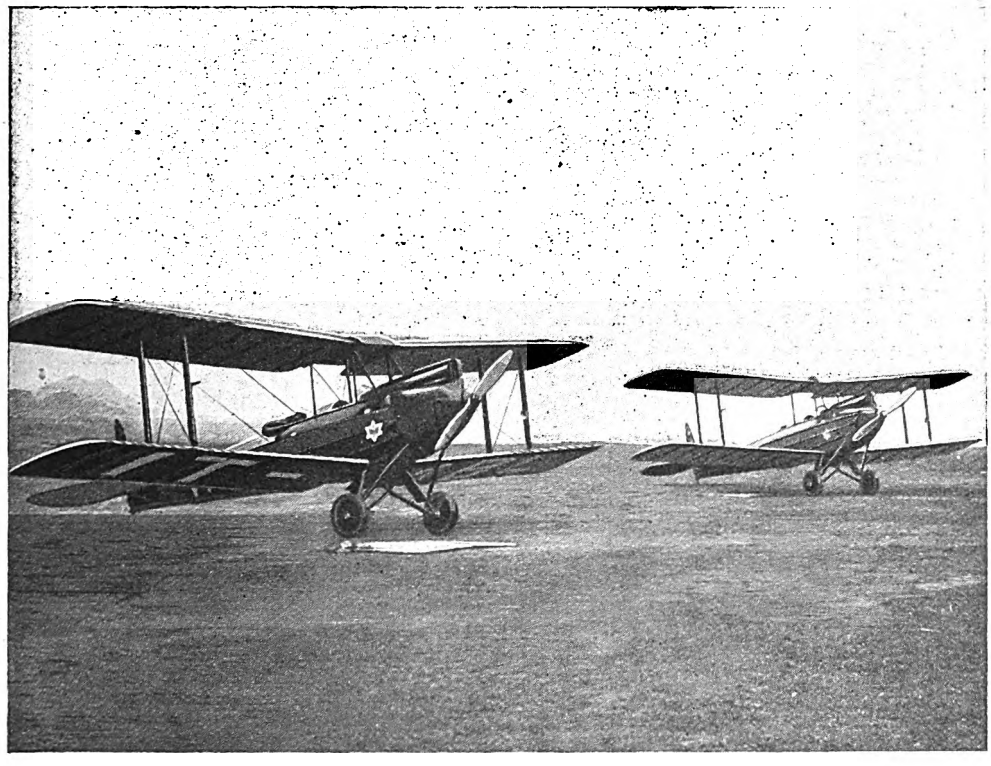

"Topical" photograph.

CELLON

The dope of proved efficiency

The above photograph illustrates two Moths delivered a short time ago to the Asiatic Petroleum Co. These machines are finished in a special Cellon colour scheme. Cellon Dope and Cerric Lacquers are made in all colours to suit any colour scheme. Specify Cellon for your Moth.

Cerric Cellulose Lacquers comply with D.T.D. Specifications for metal parts, cockpits, propellers. Particulars on application.

CELLON, LTD., Upper Ham Road, KINGSTON-ON-THAMES.

(Contractors to H.M. and Foreign Governments.)

Telephone: Kingston 6061 (5 lines).

Telegrams: "AJAWB, 'Phone, Kingston-on-Thames."

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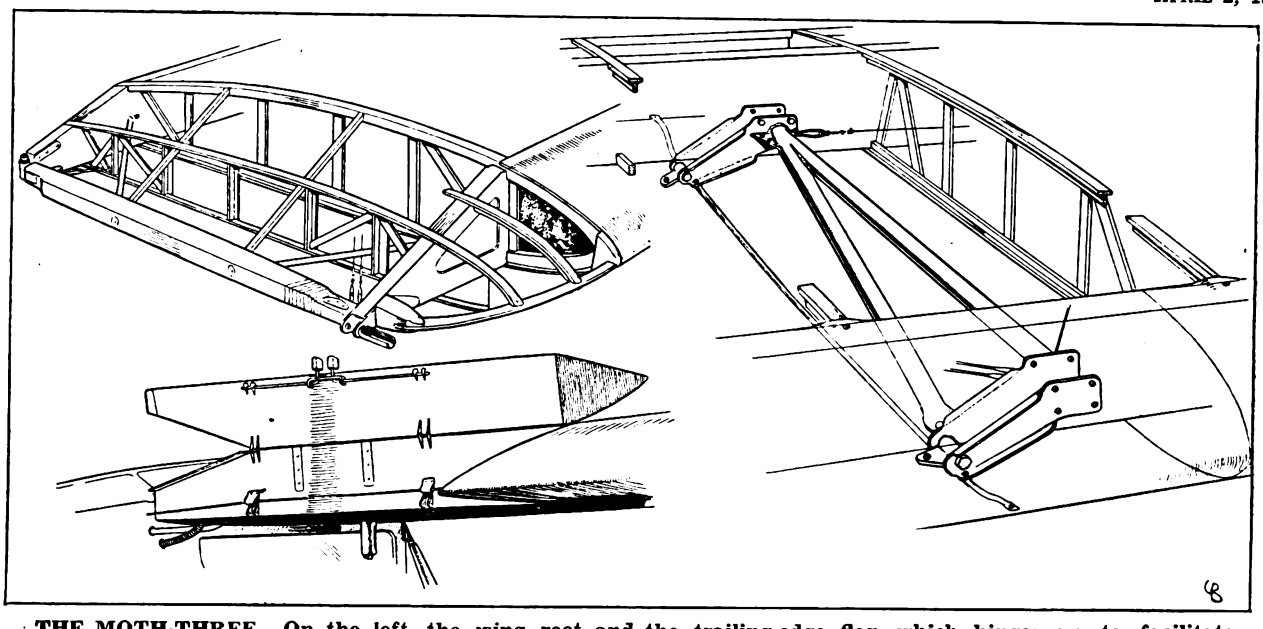


THE MOTH-THREE.—On the left, the wing root and the trailing-edge flap which hinges up to facilitate folding the wing. On the right, the attachments to the spars of the fittings for wing-bracing struts.

it has a high top speed and a very flat glide. The action of the air brakes is to make the normal angle of glide steeper and increase it from about 1 in 11 to approximately 1 in 7.

The effectiveness of the air-brakes may be judged by the fact that, if put into action when flying, and not when merely landing, they reduce the top speed from round about 130 m.p.h. to about 95 m.p.h. In other words, the air-brakes reduce the gliding speed of the Moth-Three to that of the Gipsy-Moth at will by a very simple and practical means.

The result is that although the Moth-Three has a very high performance, the provision of this performance does not interfere with the landing qualities of the machine.

A steerable tail-skid is provided and this will be replaced later by a tail-wheel when suitable wheel-brakes of a small size have been developed for the Moth-Three.

POWER-PLANT.

The power-plant of the Moth-Three is the new D.H. Gipsy III four-cylinder-in-line inverted air-cooled engine. The use of an inverted engine improves the forward view from the pilot's seat to an extent not yet provided in any other machine. It also reduces the noise in the cabin and gives a higher thrust-line, which last advantage allows the whole machine to be lower on the ground, with a corresponding increase of ground stability and of accessibility to the cabin and engine, and yet adequate ground-clearance for the airscrew.

The engine is almost entirely cowled-in. The side cowling is arranged in two panels, one on either side, hinged along their top joints. By undoing two quick-releases at the bottom either panel may be opened upwards to give access to all engine accessories.

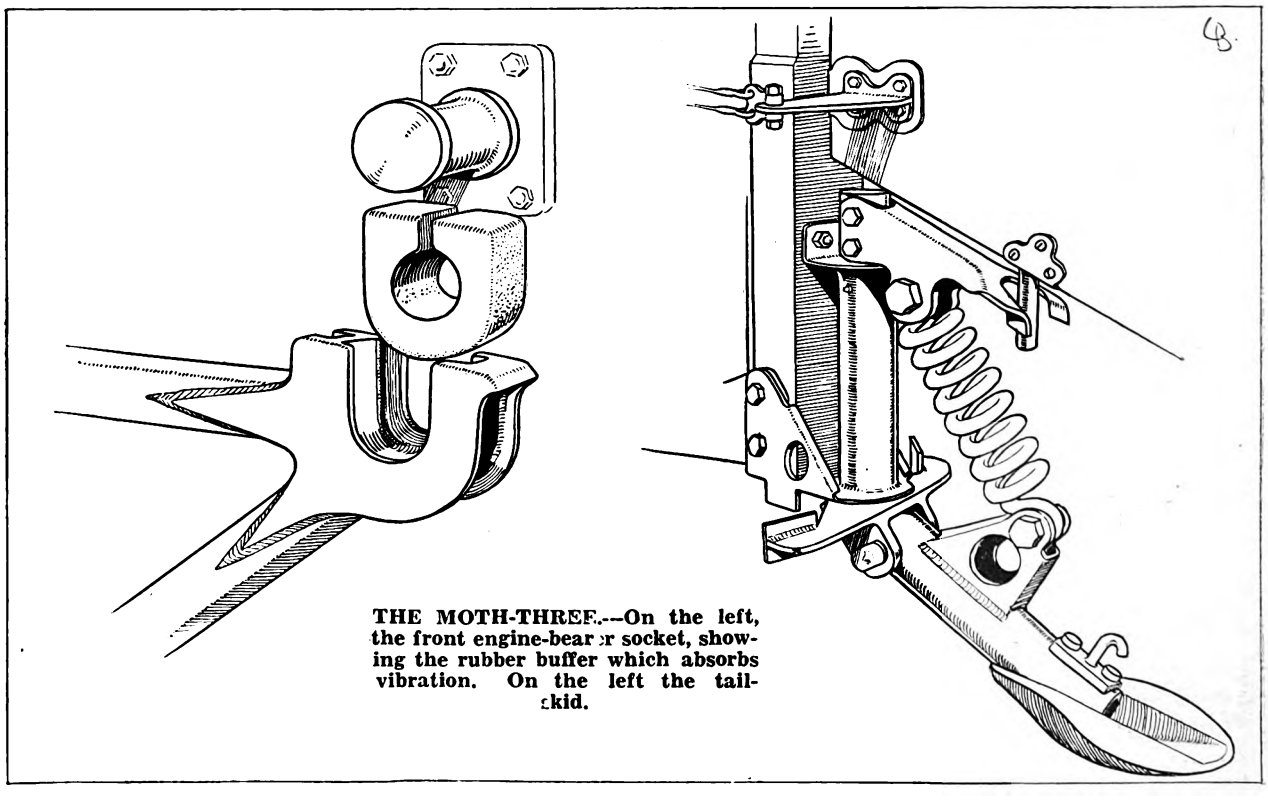
By undoing four wing-nuts the whole top cover may be removed and the engine is then completely exposed.

The cooling of the engine is by a vertical slot in the nose-cowling which connects with a scoop, which is an integral part of the engine.

The two fuel-tanks are carried one in each wing and two different sizes of tanks may be supplied, one of 22 gallon and the other of 35 gallon total capacity.

The tanks are of welded aluminium, and each tank has a combined petrol-gauge and sludge-collector and pipe-connection, which only causes the welding of one fitting to the tank. Petrol is led to the engine by gravity through internally and externally armoured flexible tubing.

The oil-tank is mounted on the left side of the fuselage and the oil is cooled by the air flow over its side.



THE MOTH-THREE.—On the left, the front engine-bearer socket, showing the rubber buffer which absorbs vibration. On the left the tail-skid.

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After 51,000 Miles

without decarbonisation, performance equal to that of a new engine!

THE GIPSY MOTH

Sealed Reliability Tour commenced on Dec. 28th, 1928, when a standard Gipsy engine was mounted in a standard Moth and sealed throughout by Government officials, making replacements impossible without breaking seals.

For nine months the engine ran faultlessly, lubricated with CASTROL XXL, receiving routine attention only except for the correction of a minor magneto fault.

The consumption of CASTROL XXL averaged .45 pints per hour, or nearly 1500 miles per gallon.

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CABLES BENTLEY CODE

9th October 1929.

Ref. FTH/WU.

Messrs. C. C. Wakefield & Co. Ltd.
Wakefield House,
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Dear Sirs,

You will undoubtedly be pleased to hear that the SEALED GIPSY Engine has now completed its 600 Hour Reliability Trial, and we have now unsealed and opened it for Inspection.

During this period, 51,000 miles have been flown in addition to 61½ hours running up and taxying. At the conclusion of this trial, the performance was checked and found to be equal, in every way, to that of a new Engine.

The way in which this GIPSY Engine has maintained its tune after such an enormous mileage, without decarbonisation is a great tribute to the quality of the CASTROL XXL Oil which was used throughout the Trial, and fully justifies us in recommending its use to all who operate GIPSY MOTH Light Aeroplanes.

Yours faithfully,
FOR THE DE HAVILLAND AIRCRAFT CO. LTD.

F. T. Hearle.
DIRECTOR.

A great tribute to the quality of

WAKEFIELD

CASTROL XXL

C. C. WAKEFIELD & CO., LTD., *All-British Firm*, Wakefield House, Cheapside London, E.C.2

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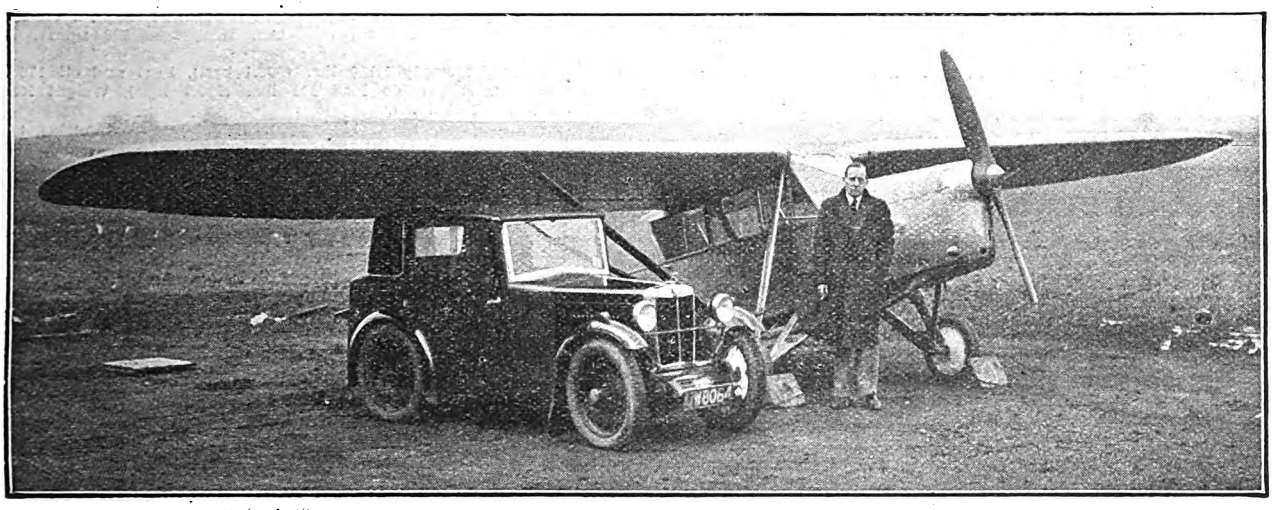

Capt. H. S. Broad with his M.G. Midget Sportsman's Coupe and a Moth Three

A Sporting Double

The very latest thing in economical transportation by air and by land. Captain Broad, the well known test pilot of the De Havilland Aircraft Co. Ltd., with the new MOTH THREE and his M.G. MIDGET SPORTSMAN'S COUPE—his third M.G. Car.

The MOTH THREE has a top speed of over 125 m.p.h., covers 18 miles on a gallon of petrol, while its running costs are no higher than those of the standard open cockpit Moth. The MOTH THREE seats 3 people in comfort and embodies ample luggage space for doing a prolonged tour with special provision for the accommodation of such things as golf clubs, guns, fishing tackle, cameras, rations and whatnot.

The M.G. MIDGET SPORTSMAN'S COUPE has a top speed of over 60 m.p.h., covers over 40 miles to the gallon of petrol. There is exceptionally large luggage accommodation while the sliding roof provides the joys of an open car at will.

8/33 M.G. Midget Sports from £185
18/80 M.G. Six Sports from £510

MG

The M.G. Car Company, Abingdon-on-Thames

Phone 251 *Wire: "Emgee"*

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Rudder cables run within the box to a cross lever in the same location aft of the cabin as the elevator levers and further cables lead direct to the rudder.

Unsplinterable glass windows extend along the sides of the cabin and round the front. Transparent panels in the roof give good visibility upwards and backwards, which is increased by the thinning of the wing-roots and the slight doming of the sides of the roof, to a fairly flat angle sideways over the wings.

Three standard finishes for the interior of the cabin will be provided. These will be in blue, maroon, and brown leather fabric.

Every effort has been made to deaden noise. All windows are mounted on thin filets of sorbo rubber and the side walls of the cabin will be double with noise-deadening material between.

The whole machine shows a great amount of clever thinking over the problems of producing a light machine with high performance and providing a degree of comfort yet unattained in this type of machine.

SPECIFICATION.

Landplane.

DIMENSIONS.—Span 36 ft. 9 in. (11.2 m.), Length 25 ft. (7.6 m.), Span (folded) 13 ft. (3.95 m.), Length (folded) 26 ft. 3 in. (7.98 m.), Chord (max.) 6 ft. 6 in. (1.98 m.), Wing area 222 sq. ft. (20.6 sq. m.).

WEIGHTS.—Weight empty 1,150 lbs. (522.1 kgs.), Fuel and oil 178 lbs. (80.8 kgs.), Disposable load 572 lbs. (259.7 kgs.), Weight loaded 1,900 lbs. (862.4 kgs.).

PERFORMANCE.—Speed, max., 125 m.p.h. (200 km.p.h.), Cruising speed 105 m.p.h. (168 km.p.h.), Stalling speed 48 m.p.h. (76.8 km.p.h.), Initial rate of climb 660 ft./min. (200 m./min.), Service ceiling 13,000 ft. (3,950 m.), Range (small tanks) at cruising speed 440 miles (700 kms.).

Seaplane.

WEIGHTS.—Weight empty 1,290 lbs. (585.6 kgs.), Fuel and oil 178 lbs. (80.8 kgs.), Disposable load 432 lbs. (196 kgs.), Weight loaded 1,900 lbs. (862.4 kgs.).

PERFORMANCE.—Speed, max., 123 m.p.h. (196.8 km.p.h.), Cruising speed 105 m.p.h. (168 km.p.h.), Stalling speed 47 m.p.h. (75.2 km.p.h.), Initial rate of climb 645 ft./min. (196 m./min.), Service ceiling 11,500 ft. (3,500 m.), Range (small tanks) at cruising speed 430 miles (670 kms.).

PRICE.—Landplane £1,000, Seaplane £1,250.

THE D.H. GIPSY ENGINE.

The De Havilland Aircraft Co., Ltd., entered the Aero-engine Industry in 1927 when they produced the Gipsy engine as a power-plant for light aeroplanes.

The Gipsy engine was designed by Major F. B. Halford, the designer of the B.H.P. engine (which later became the Siddeley Puma) and of the Cirrus engine, in collaboration with Capt. Geoffrey de Havilland, the founder and present Managing Director of the De Havilland Company.

The Gipsy engine was produced by the De Havilland Company to provide a power-plant suitable for the aeroplane of the private owner, Flying Club and Flying School at from one-half to one-third the cost which would be considered reasonable for any other class of aero-engine.

The conditions to be fulfilled by such a light aeroplane engine may be summarised as follows:—

(i) It must have sufficient power to take a fully-loaded aeroplane off a small and sticky aerodrome without an unduly long run and the margin of power must be ample so that cruising speed is obtained with a small throttle opening;

(ii) It must be absolutely reliable and remain so with the minimum of attention;

(iii) It must be easy to start under all climatic conditions;

(iv) It must run satisfactorily on any brand of No. 1 petrol and on any good lubricating oil;

(v) It must be simple, accessible and easy and cheap to maintain;

(vi) It must be capable of running if necessary at least 150 hours between top overhauls and at least 400 hours between complete overhauls;

(vii) It must be reasonably quiet but not unduly heavy.

On top of all these essentials the use of the simplest, soundest and least expensive of materials is required to keep the initial and running costs of the engine within reasonable limits.

The ultimate design chosen was a four-cylinder in-line air-cooled engine and a series of six engines was produced to give an output of 150 h.p. at 3,000 r.p.m.

The first engine was built and running in June, 1927, and this engine was put into the D.H. Tiger Moth, a small, low-powered research machine which the De Havilland Company built to examine just how far performance could be increased by merely cutting down head-resistance rather than by the more wasteful method of increasing horse-power.

In this machine, owing to airscrew problems, the engine-speed was kept down to about 2,500 r.p.m., which gave between 120 and 130 h.p.

The Tiger Moth, piloted by Mr. Hubert Broad, put up a World's speed record for single-seat aircraft weighing less than 350 kgs. (770 lbs.) by making a speed of 300.1 km.p.h. (186 m.p.h.) over a 100 km. circuit, which meant doing 200 m.p.hr. on the straight.

After a year's experimental period, during which over one thousand hours were run with the engines both in the air and on the test-bed, the output was reduced to 100 h.p. at 2,100 r.p.m. and an engine was submitted to the Air Ministry Type Test.

In this respect the Gipsy was the first engine to complete its type-test running on ordinary No. 1 petrol,—a very important feature when the requirements of this type of engine are borne in mind.

In the last hour of the type test, during which an engine must be run at full throttle and maximum speed, the Gipsy developed over 97 h.p. at 2,100 r.p.m.

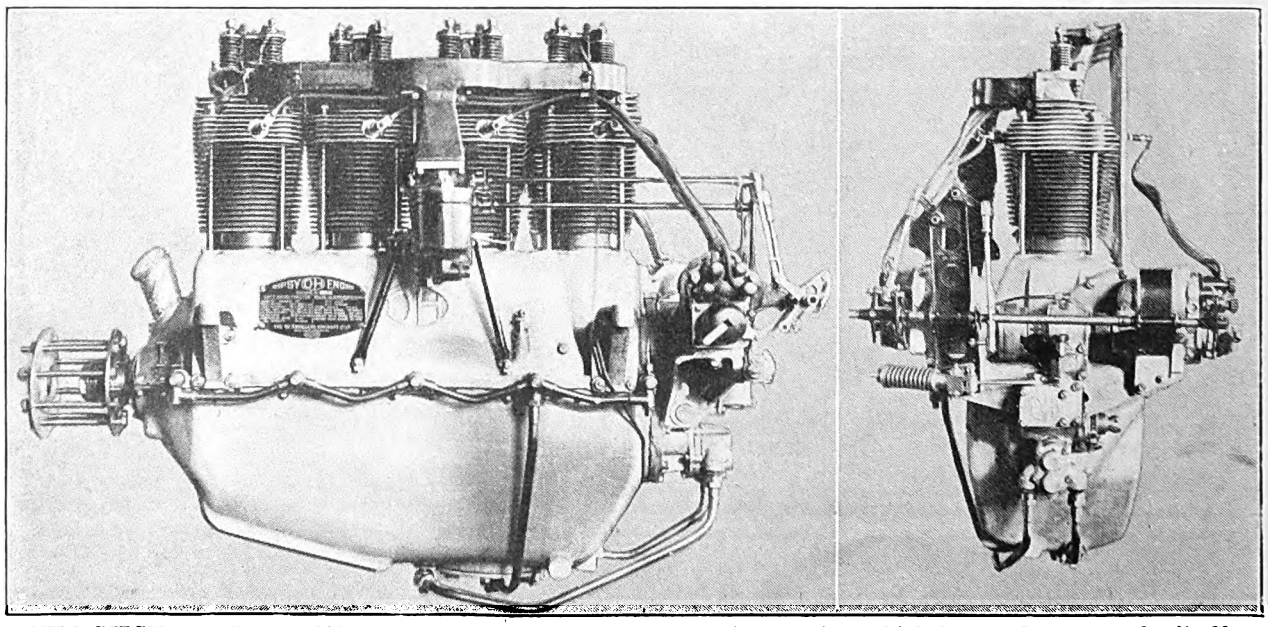
Throughout the entire test the oil consumption averaged under half-a-pint per hour.

The first aircraft to be fitted with the Gipsy engine was, perhaps naturally, the D.H. Moth, but the immediate success of this engine in this machine soon resulted in its installation in several other types of British and foreign light aeroplanes.

During 1928 two more World's Records were won for Great Britain by the Gipsy engine.

On July 27 Capt. de Havilland, with Mrs. de Havilland as passenger, reached a height of 19,857 ft. in a standard Moth biplane and on Dec. 7 Mr. Alan Butler, Chairman of Directors of the De Havilland Company, with Mrs. Butler as passenger, put up a Speed Record for two-seat light aircraft weighing less than 400 kgs. (880 lbs.) by flying at 192.86 km.p.h. (119.7 m.p.h.) over a 100 km. circuit, this time in a special coupé Moth biplane.

A standard Gipsy-Moth flown by Mr. W. L. Hope won



THE GIPSY I ENGINE.—Side and rear views of the standard Gipsy engine, which has made a name for itself all over the World.—(*"Aeroplane" photographs.*)

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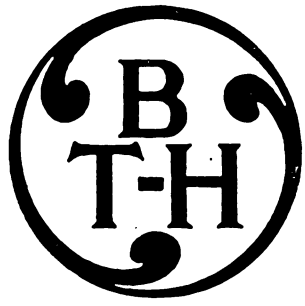

Magnetos

were used for these

NOTABLE ACHIEVEMENTS

The Schneider Trophy Contest, 1929, 1st Place.
The World's Air Speed Record - 357·7 m.p.h.
1st & 2nd Places in every King's Cup Air Race.
1st & 2nd Places in every Aerial Derby.
First Non-stop Flight to India.
World's Motor Boat Speed Championship.
German Motor Boat Speed Championship.
World's Speed Record for Cars.

These and many similar achievements demonstrate the ABSOLUTE RELIABILITY OF B.T.H. MAGNETOS.

The British Thomson-Houston Co., Ltd.

ELECTRICAL ENGINEERS AND MANUFACTURERS

Alma Street - Coventry

Works: COVENTRY, RUGBY, BIRMINGHAM, WILLESDEN and CHESTERFIELD.

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the 1928 King's Cup by flying 1,100 miles round England and the south of Scotland at an average speed of 100 m.p.h. This was the first big public test for the Gipsy engine and the fact that it stood two days' hard flying at full throttle stamped it as a thoroughly reliable engine capable of standing up to any treatment likely to be met under almost any conditions.

In July, 1928, Mr. Hubert Broad put up an unofficial duration record of 24 hours in a standard Gipsy-Moth, during which he covered a distance of about 1,440 miles. This, if flown in a straight line, would have easily beaten the World's Distance Record for light aircraft. On this flight the engine consumed an average of 2¾ gallons of petrol per hour and the oil consumed in the 24 hours was only 1¼ gallons.

In 1929 a standard Gipsy-Moth flown by Mr. Hubert Broad and carrying a passenger won the first prize in the "Heavy Category," that is for two-seat machines weighing between 350 and 400 kgs. (770-880 lbs.), in the *Challenge Internationale de Tourisme,* a particularly gruelling contest which involved a tour of Europe, 3,907 miles' long, taking the competitors over particularly difficult country under very indifferent weather conditions. During this tour Mr. Broad maintained an average speed of 96 m.p.h.

Another fine performance with a standard Gipsy engine was the winning of the 1929 *Coupe Zenith* by Mr. Broad in a special Moth coupé biplane. This involved flying, with a passenger, a circuit of France, 1,044 miles long, with five compulsory stops, at an average speed of 112.5 m.p.h. This speed, which was computed on the total elapsed time for the whole circuit, including the stops, was nearly 30 m.p.h. faster than the next competitor.

THE SEALED ENGINE TEST.

The crowning achievement of the year, however, was the successful conclusion of a 600 hours' Reliability Tour by a Gipsy engine in a Moth biplane.

This tour was begun on Dec. 27, 1928, and was continued for nine months. A standard Gipsy engine was taken at random from the ordinary production line and after installation in the machine was sealed all over by officials of the Aeronautical Inspection Directorate of the Air Ministry. The sealing was such that it was impossible to do any work or make any adjustments on the engine without breaking the seals.

The machine was then put to the task of flying for 600 hours without overhaul, repair or replacements, the Moth to cruise, as far as possible, at a constant speed of 85 m.p.h.

For nine months this engine ran faultlessly The only attention that was given to it was confined to occasional routine cleaning of filters and sparking plugs, checking of contact-breaker and valve clearances and the correction of a minor defect in the impulse starter mechanism of one magneto.

Throughout the enormous mileage of 51,000 miles not the slightest trouble whatsoever was experienced.

At the conclusion of the 600 hours' test the engine was put on the test-bench, where it showed a drop in output of only 2.5 h.p. in spite of the fact that no decarbonising had been done and the valves had not been reground.

For the total running time of 661 hours, which included bench-tests, taxying and running-up, the engine showed a petrol consumption of 4½ gallons per hour, or 19½ miles to the gallon, and an oil consumption of 0.45 pints per hour, or 1,400 miles to the gallon. This represented a cost in petrol and oil of 1d. per mile flown.

No automobile engine in any category has ever put up such a performance.

After the test the engine was then taken down and every part was subjected to a searching scrutiny under the supervision of the A.I.D. It was found that the cost of replacements necessary to recondition the engine for a renewal of its certificate of airworthiness was £7 2s. 11d. These replacements were, without exception, confined to those inexpensive and easily-renewable parts in which slight wear is expected under prolonged service in any internal combustion engine.

This performance, unapproached within fifty per cent., so far as is known, by any aero-engine in the World of whatever size, provides a convincing indication of the high standard of design and workmanship by the De Havilland Aircraft Co. Ltd.

THE GUARANTEE.

In December, 1928, the De Havilland Company announced that on and after Dec. 1 every aircraft with a Gipsy engine which was delivered new and unused to its owner would, subject to certain reasonable conditions, be repaired free of charge at the cost of the company if damaged in a forced landing caused by a failure of its engine.

This declaration of faith by the De Havilland Company in the Gipsy engine, because of its proved reliability, represented a novel and courageous departure in policy for any firm in the Aircraft Industry.

It means that the De Havilland Company guarantees their engines against breakage of any part made by them when it is fitted in an approved type of light aeroplane holding a British Certificate of Registration and Airworthiness and being used in Europe for private flying, training, taxi-work or ordinary commercial purposes.

In 1929 the Wright Aeronautical Corporation of Paterson, N.J., U.S.A., the World-famous manufacturers of air-cooled radial engines, wanted to produce an engine suitable for light aircraft. Rather than devote the time to designing and building an engine of their own they examined the existing types of British and foreign engines with a view to acquiring the manufacturing licence for the United States. Of the many types available they chose the D.H. Gipsy, and this engine is now being made and marketed in the United States under the name of the Wright Gipsy.

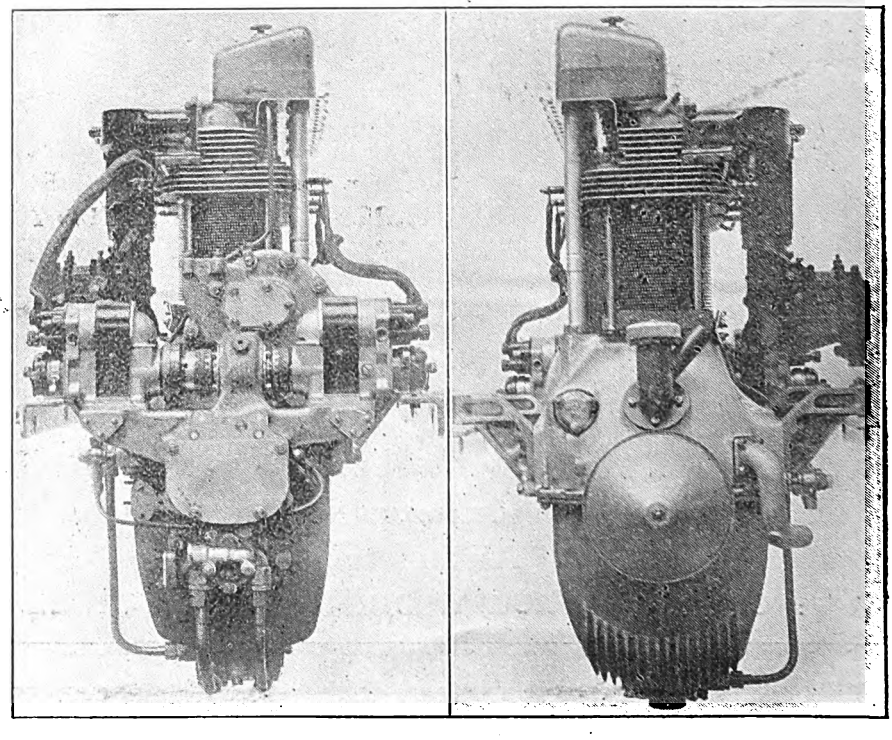
Gipsy engines are now being used in practically every country in the World. The outstanding performance of the Gipsy in open competitions and in the 600-hour Reliability Test already mentioned has assured for it a World-wide reputation and this reputation is being ably maintained by the work of hundreds of Gipsy engines in use under climatic conditions ranging from the arctic cold of Northern Canada to the tropical heat of Central Africa.

The successful operation of all these engines is ably supported by a service organisation which must be second to none in the whole World.

In Great Britain there is a regular day and night Gipsy Service Headquarters at Stag Lane which is in constant communication with branches, stockists and agents in both hemispheres. There are agents for "servicing" Gipsy engines throughout the British Isles and in practically every country in the civilised World. In Canada, India and Australia the De Havilland associated companies carry large stocks of spares for local users and the vast Curtiss-Wright organisation attends to the needs of Gipsy users in the United States.

In 1930 the De Havilland Co. have produced two new Gipsy engines of a slightly increased power over the original Gipsy engine. Both new engines are essentially the same, except that one is a normal engine with cylinders above the crank-case, and the other is an inverted engine.

In the following description the three engines, which are known as the Gipsy I, Gipsy II and Gipsy III (the last-mentioned is the inverted engine), will be described together under each component heading.



THE GIPSY II ENGINE.—Rear and front views of the new 120 h.p. Gipsy engine —(*"Aeroplane" photographs.*)

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For the GYPSY MOTH

the De Havilland Aircraft Co.

officially recommend

SHELL OIL

Use "GOLDEN SHELL" OIL for normal conditions

And "DOUBLE SHELL" OIL for arctic conditions

"Shell" Aviation Spirit is used for the bench tests of all Gypsy engines and the first flights of all new Moths

The following recent flights with "Gypsy" Moths under extreme conditions of heat and cold were all made on "Shell" Aviation Spirit and "Golden Shell" Oil:

1—Mr. F. C. Chichester's recent flight from London to Australia in 17 flying days.

2—Messrs. Wood and Fry's flight in Mrs. Wilson's "Gypsy" Moth from London to Nairobi.

3—Flight-Lieut. F. A. Swoffer's flight from London to Nairobi.

4—Mr. A. Campbell Black's flight from Nairobi to London.

5—The "Gypsy" Moth attached to Sir Douglas Mawson's "*Discovery*" made several successful flights in the Antarctic using "Shell" aviation spirit and "Double Shell" lubricating oil.

6—Mr. R. N. Chawla's flight from Karachi to London.

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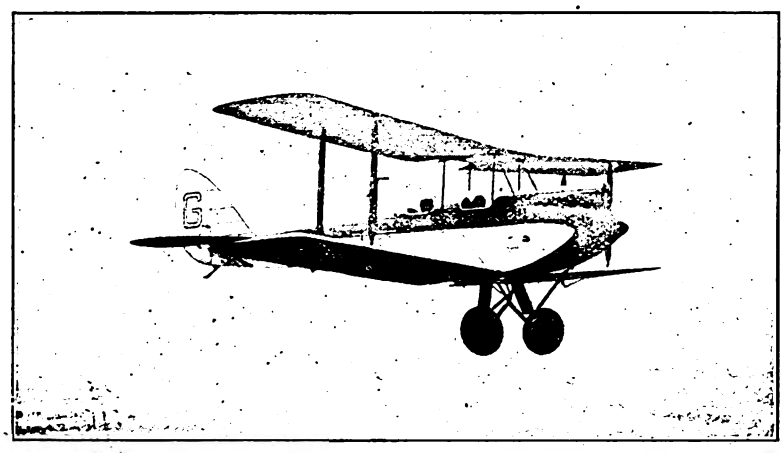
FOR EVERY TYPE OF AERO ENGINE.



The GIPSY MOTH.

INSIST ON AIRSCREWS

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airscrew. These two engines may therefore be used as either tractor or pusher engines, if suitable cooling arrangements are made when used as pushers.

The airscrew hub is of an improved type. A steel sleeve is driven into the airscrew and forms an integral part of it. Location on the crank-shaft is taken on the internal bore and rear face of this sleeve, and adequate front and rear locking arrangements are made. This obviates possible damage to the inside bore of the airscrew during removal or by movement due to bolts being incorrectly tightened up. A spinner is also incorporated on the airscrew hub.

CRANKCASE.

Gipsy I.—An aluminium alloy casting. The top half carries the five main crankshaft bearings, which are held in position by separate caps. The lower half forms the sump, which is of the "wet" type and has an oil capacity of two gallons, or sufficient for fifteen hours' flying. A gauze oil-filter tray is fitted. In the bottom of the sump is the pressure oil filter and the oil pressure release valve, both easily accessible for cleaning and adjustment. External fins are cast on the underside of the sump to maintain a low oil temperature.

Gipsy II.—An aluminium alloy casting of cleaner external form than on Gipsy I. A facing has been added to take the A.C. fuel pump, and bosses for cowling attachment are provided. The sump capacity has been increased to 2½ gallons. Crankcase and timing-gear cover are interchangeable on Gipsy II and Gipsy III engines to facilitate production. Bearer-feet facings on all three Gipsy engines are the same.

Gipsy III.—As this engine runs in an inverted position the sump on the Gipsy II is replaced by a top cover, which is big enough only to clear the crankshaft and big-ends. This cover is well provided with cooling fins, and an oil radiator has not been found necessary.

TIMING GEARS.

Gipsy I.—These are located at the rear of the engine and are housed in a separate cover. The cam-shaft is driven by spur-gears from the crankshaft and a vernier coupling is provided between the gear-wheel and the cam-shaft flange.

Gipsy II and *Gipsy III.*—The modifications in these engines include an increase in the width of the gear teeth to give much longer life, and a gear train is now built up in small unit assemblies to allow greater ease in setting up end clearances, etc. Provision is also made for fitting a dual tachometer drive if necessary.

An experimental hand-starter is being developed, and two other positive starting devices are also being tried in addition to the impulse-starter, which is retained as standard on one of the magnetos. A B.T.H. 38 mm. magneto is fitted as standard, but the new design of the timing-gear cover allows for the fitting of a magneto whose armature centre is 45 mm. above the base if necessary.

CAMSHAFT AND TAPPETS.

Gipsy I.—Valves are operated by rockers through duralumin tubular push-rods which have hardened steel balls in each end. The rockers are mounted on rigid steel brackets bolted to the cylinder-heads and oscillate in phosphor-bronze bushes. The valve-springs are duplicated. Tecalemit lubricating nipples are fitted to the centre of the hollow rocker-spindles through which the bearings are lubricated. Similar nipples are also fitted to the adjustable ball ends over the tappet rods.

Gipsy II and *Gipsy III.* —In these engines the whole of the valve-gear is now completely enclosed in light dust- and oil-proof covers. These are easily and quickly removable for access to the valve-rockers, etc. In the Gipsy II the valve-rocker spindles are lubricated under pressure from the main oil gallery (see Lubrication). The new design of rocker spindle allows the removal of individual rockers without tools and without disturbing any other parts after the valve-gear cover for that particular cylinder has been removed.

INDUCTION SYSTEM.

Gipsy I, Gipsy II and *Gipsy III.*—Manifold-heated in all three engines. The carburettor is normally gravity-fed, but may be fed direct by A.C. or gear-type petrol pump.

LUBRICATION SYSTEM.

Gipsy I.—Wet-sump type. Oil is drawn from sump by gear-type pump and passed through an adjustable pressure-relief valve to pressure oil-filter. From lower part of this filter oil is fed to an external gallery and thence through passages to each of the five main bearings. A small feed at the rear end of this gallery supplies the timing-gears. From the main bearings oil is forced into the hollow crank-pins and thence to big-ends. Piston lubrication is by special leak-holes in the crank-pin seats. Camshaft bearings, tappets and cams are lubricated by oil thrown from crankshaft.

Gipsy II.—Capacity of sump increased from 2 to 2½ gallons. The pressure filter is in sump, but this may now be withdrawn vertically downwards by removal of one nut and without disturbing any pipe-lines. Additional leads are taken from the main oil gallery to the overhead valve-gear, and each valve-rocker-bracket is fitted with a metering plug to avoid flooding the valve-gear. After passing this plug oil enters the rocker-spindle and thence by way of holes in the rocker and a channel milled along the top of each rocker to the cups and ball of the push-rod at one end and to the pad and valve-stem at the other. Surplus oil drains down the push-rod casings and lubricates the tappets. The quantity of oil in the sump is ascertained by a dipper-rod in the side of the crank-case, as on the Gipsy I.

Gipsy III.—As this engine runs in an inverted position the oil supply must be carried in a tank on the aircraft. The lubrication of the crank-shaft, connecting-rods, cylinders, cam-shaft and timing-gear is, in the main, the same as on the Gipsy II, but no suction filter is provided. The pressure filter is on the rear of the engine and withdraws horizontally to the side of the engine. The valve-gear, being below the engine, is not fed under pressure, but grooves are provided in the tappet guides down which the oil passes by way of the push-rod casing tubes to the valve-gear covers. A drain is arranged in each cover so that a constant level is maintained even when standing. The valve-rocker strikes this oil and all gear parts are thus splash-lubricated. Oil in the crank-case drains down to two large openings, one at the front and one at the rear of the engine, and thence by gravity to the oil-tank in the aircraft. No scavenger pumps are fitted.

COWLING.

Gipsy II and *Gipsy III.*—Special cowling panels have been evolved after extensive experiments, and these give the most efficient cooling with a minimum of frontal area. These are supplied with the engines and in no way govern the shape of the nose of the aircraft. In the complete installation the engine-cowling is enclosed inside the machine cowling.

CONTROLS.

Gipsy I.—An engine-control lay-shaft is mounted on pressed-steel brackets bolted to the rear cover. The advance and retard controls for the two magnetos are synchronised and interconnected with the main throttle control.

Gipsy II and *Gipsy III.*—On these engines the pickup levers may be on either port or starboard and may either pull or push to open. Throttle and magneto controls are interconnected so that full advance is obtained at between one-third and one-half throttle, the remainder of the throttle opening not moving the magneto. Altitude control is independent in both directions.

SPECIFICATIONS.

	Gipsy I.	Gipsy II.	Gipsy I I.
Bore and Stroke	114 x 128	114 x 140	114 x 140
Compression Ratio	5 : 1	5.2 : 1	5.2 : 1
Power output (fully corrected at max. R.P.M.) ...	98.5 at 2,100	120.5 at 2,200	122 at 2,200
Weight (dry including airscrew hub)	285 lbs.	295 lbs. (includes oil sump and airscrew spinner)	285 lbs. (dry sump. Includes airscrew spinner)
Weight per H.P. (max.) ...	2 85 lbs	2.44 lbs.	2.4 lbs
Petrol consumption (at max. R.P.M. and max. H.P.) ...	0.6 pts. per H.P./hr.	0.57 pts. per H P./hr.	0.57 pts. per H.P./hr.
Oil consumption (at max. R.R.M. and max. H.P.) ...	0.5—0.75 pts. per H.P./hr	0.75—1.0 pts. per H.P./hr.	0.75—1.0 pts. per H P./hr.

GIPSY ENGINE VALVE STEELS.

The steel used for the valves of the Gipsy engines is supplied by Kayser, Ellison and Co. Ltd., of Carlisle Works, Sheffield, and is of the well-known K.E. 965 quality. The properties of this steel make it ideal for the purpose.

In the first place it has very high strength at the temperatures which are reached, especially in exhaust valves. Even at 900 degrees Centigrade the tensile strength does not fall below an average of 16 tons per square inch, which is very much higher than that of steels which have hitherto been used.

When subjected to very long runs these valves maintain their shape and do not cause trouble by permanent stretching.

The corrosive and erosive action of the hot gases is naturally very severe on valves, but the steel used in the Gipsy engine valves is of such quality as to withstand these actions without losing that perfection of seating surface which is so important for the highest efficiency.

The effect of different conditions of atmosphere have little or no effect on the valves and the corrosive action of salt spray does not affect them in any way.

Combined with these desirable qualities, K.E. 965 valves have a remarkable degree of ductility, which adds to the freedom from valve troubles.

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AMPHIBIAN UNDERCARRIAGE fitted to a De Havilland GIPSY-MOTH.

HOW IMMENSELY MORE PLEASUREABLE FLYING BECOMES IN A LIGHT AMPHIBIAN MACHINE!

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CIRRUS ENGINES.

The first Cirrus engine was produced early in 1925 by A.D.C. Aircraft Ltd. and made its flying debut in the first D.H. Moth to be produced by the De Havilland Aircraft Co. Ltd.

The progressive advance of the Moth and of private flying all over the World may therefore be attributed in great part to the enterprise of A.D.C. Aircraft Ltd. in anticipating the demand for a light and robust aero-engine and in producing an engine which from its inception has proved to be a remarkably reliable and successful power-plant.

The early success of the Cirrus engine is bound up with the success of the Flying Club movement throughout the British Empire and all the pioneer light aeroplane flights on Moths were made possible by the Cirrus engine. These have already been recounted in the article dealing with the Development of the Moth elsewhere in this issue so that there is no necessity to repeat them here.

The first Cirrus engine, known as the Mark I, had an output rating of 27/60 h.p., but in the Autumn of 1926 a Mark II engine was produced with an increased output of 30/80 h.p.

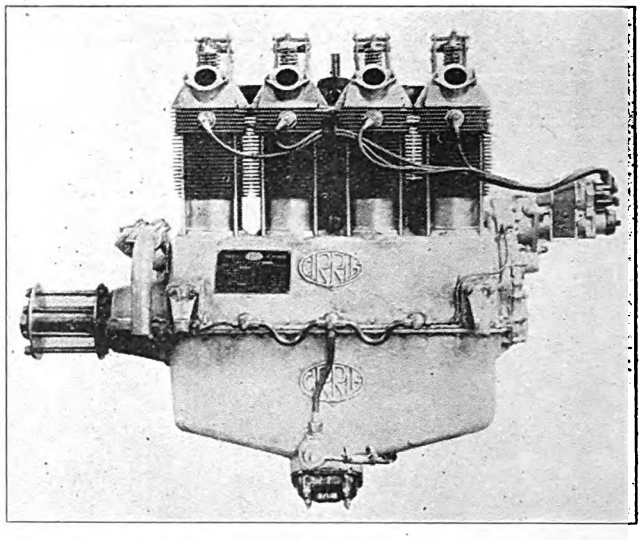
On Feb. 17, 1927, a company known as Cirrus Engines Ltd. was incorporated to take over from A.D.C. Aircraft Ltd. the design and production of the Cirrus engine.

Late in 1928 a Cirrus Mark III engine of a still slightly increased output was produced which was not designed so much to take the place of the Cirrus II as to provide an alternative and inter-changeable engine for use where rather more power is desired, such as for seaplanes, when an extra rapid take-off and climb are needed, or for use in tropical climates.

Early in 1929 Cirrus Aero Engines Ltd. produced an entirely new engine known as the Hermes. This engine was designed to give an output of 105/115 h.p. for much the same weight as that of the Cirrus III engine. The Hermes possesses the same advantages over the Cirrus III as did the latter engine over the Cirrus II, but it has incorporated in it several modifications suggested to the designers as the result of long experience with the Cirrus series.

Cirrus Engines Ltd. are now producing the Cirrus III and Cirrus-Hermes engines in series. The Cirrus III engine has been adopted by National Flying Services as their standard engine, and large numbers are giving every satisfaction not only in this country but all over the World. This engine is also being built under licence in the United States by American Cirrus Engines Inc., of Marysville, Mich., and similar rights have been disposed of in Japan.

The Hermes engine is being used by an increasing number of aircraft constructors of all nations in all types of aircraft, including multi-engined flying-boats.



The 90/94 Cirrus III engine.

Although the Cirrus III and Hermes engines are similar in general arrangement they differ in a number of minor points. The differences between the two engines are made perfectly clear in the following description, where both engines are dealt with together.

CYLINDERS.

Cirrus III and Hermes.—The cylinders are of cast iron with aluminium heads bolted down by long bolts to the crankcase. In the Hermes engine these bolts pass through holes drilled in the fins which allows for a maximum section of metal around the circumference of the cylinders. Each head has two aluminium-bronze valve-seats screwed and expanded into position. Phosphor-bronze valve guides are force fitted and two bronze sparking plug brushes are screwed with the head.

PISTONS.

Cirrus III and Hermes.—Aluminium alloy castings each with two compression, one scraper ring and a full floating gudgeon-pin.

CONNECTING RODS.

Cirrus III.—These are "H" section forgings.

Hermes.—Steel stampings machined all over. Phosphor-bronze white-metal-lined big-end bearings, the movement of which is pre-

THE CIRRUS-MOTH.—One of the fleet of Cirrus-Moths belonging to National Flying Services Ltd. flying over Hanworth.—(*"Aeroplane" photograph.*)

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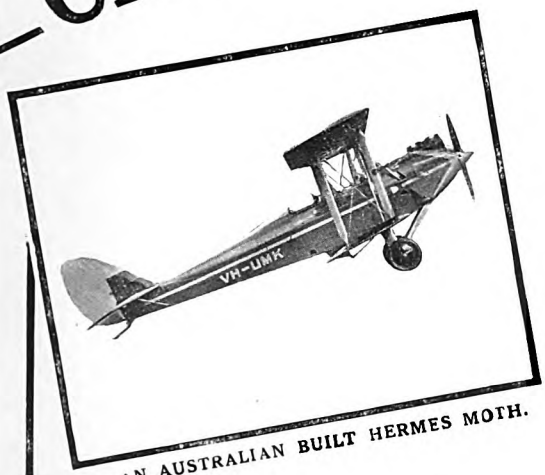
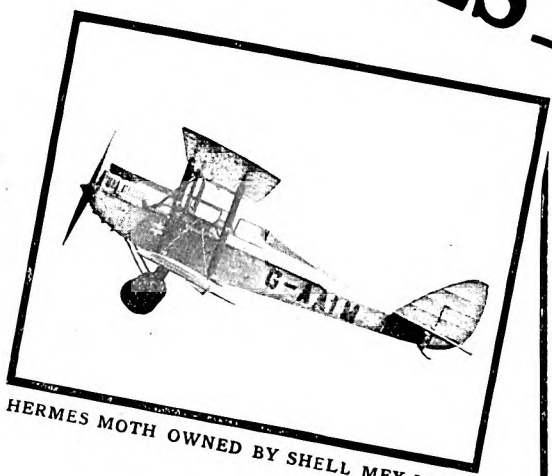
CIRRUS AERO ENGINES



AN AUSTRALIAN BUILT HERMES MOTH.



HERMES MOTH OWNED BY SHELL MEX LTD.

SOME NOTABLE FLIGHTS WITH CIRRUS MOTHS.

1925. ALAN J. COBHAM: LONDON-ZURICH. 1,000 miles in one day.

1926. H. S. BROAD: 1st IN KING'S CUP AIR RACE.
ALAN J. COBHAM: 1st IN AUSTRALIAN AERIAL DERBY.

1927. T. N. STACK & B. S. LEETE: LONDON—INDIA. 5,500 miles.
MAJOR H. De HAVILLAND: ACROSS AUSTRALIA. 2,200 miles.
MAJOR MILLER: ROUND S. AFRICA in 28 hrs. 25 mins. flying time. 2,400 miles.
W. L. HOPE: 1st IN KING'S CUP AIR RACE.
FLT./LT. R. R. BENTLEY, M.C., ENGLAND—S. AFRICA. 8,000 miles. Britannia Trophy
The HON. LADY BAILEY: ALTITUDE RECORD, 2 seater light aircraft.
The HON. LADY BAILEY: ENGLAND—S. AFRICA, 8,000 miles.
FLT./LT. R. R. BENTLEY, M.C., A.F.C: S. AFRICA—ENGLAND. 8,000 miles.

1928. Miss W. SPOONER: SIDDELEY TROPHY.
FLT./LT. R. R. BENTLEY, M.C., A.F.C.: ENGLAND—S. AFRICA, 8,000 miles.
CAPT. R. S. RATTRAY: ENGLAND—GOLD COAST. 5,000 miles.

1929. The HON. LADY BAILEY; ROUND AFRICAN CONTINENT. 18,000 miles.
GOSTA ANDREE; SWEDEN—S. AFRICA. 9,000 miles.

Part of the fleet of Cirrus-Moths in service with National Flying Services Ltd. at the London Air-Park, Hanworth.

CIRRUS AERO-ENGINES LIMITED,

REGENT HOUSE,

Cables: "Ocirruso, London." 89, KINGSWAY, LONDON, W.C.2. Telephone: Holborn 4076

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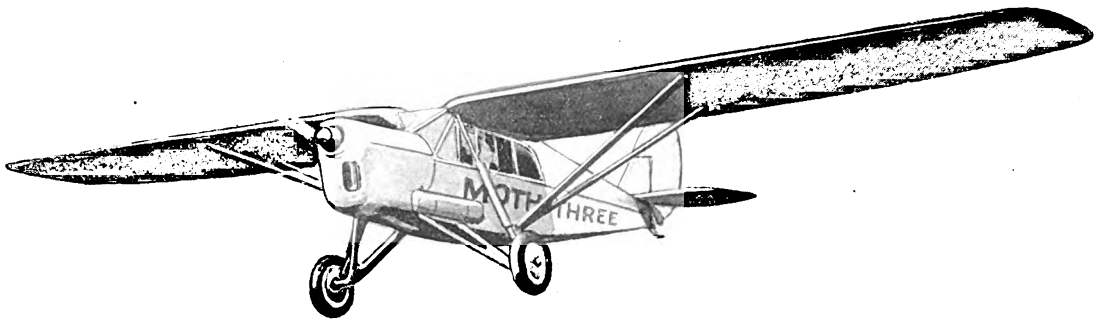

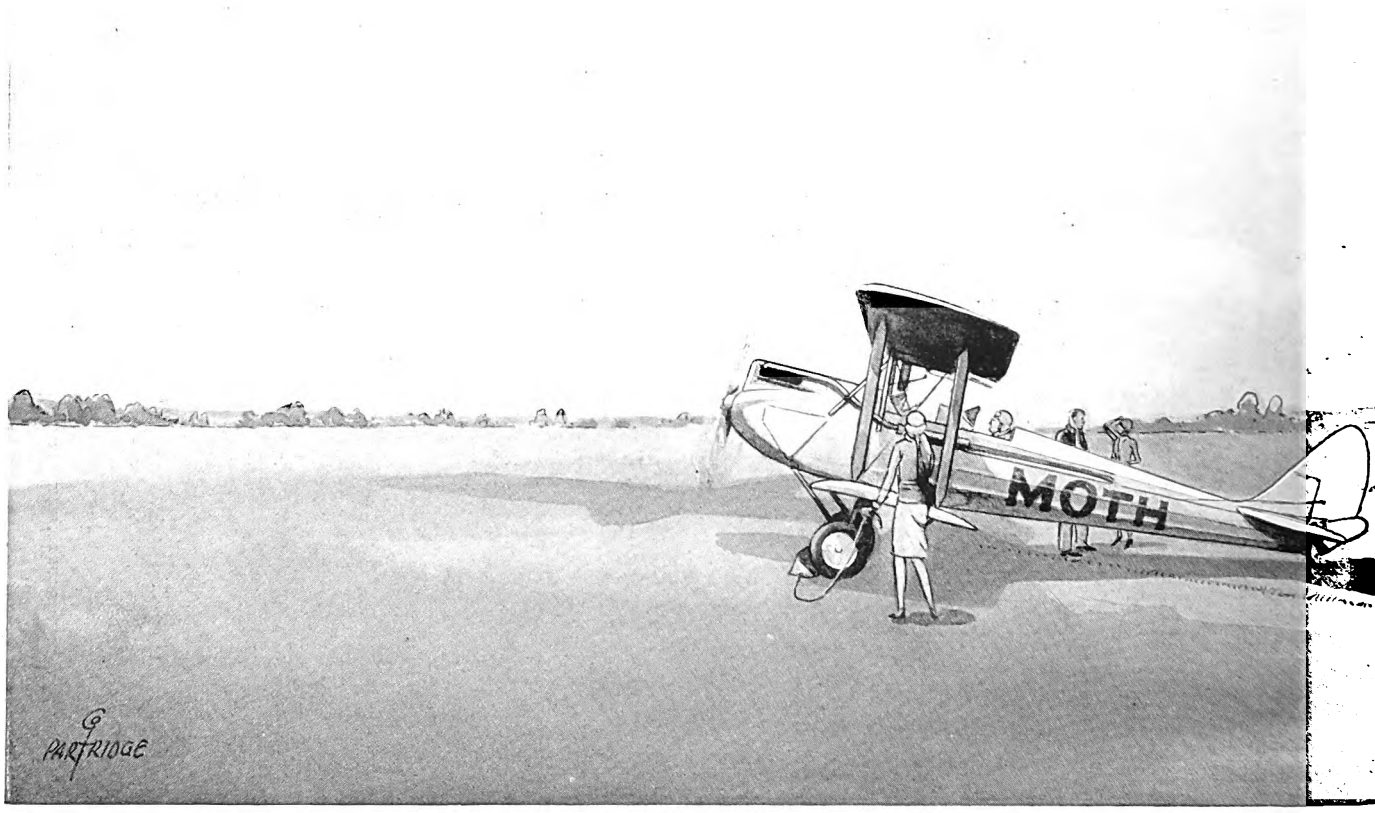

A Moth for every purse and purp

GIPSY MOTH—2-seater open-cockpit biplane. 100 h.p. Gipsy I engine. Range 290 miles with standard 19-gallon tank, at cruising speed of 85 m.p.h. Additional tankage optional. Landplane, seaplane, ski-plane or amphibian. Price from £675. Uses: Private touring, service training, aerial survey, club and school instruction, taxi and air-line work, commercial purposes and mail carrying.

MOTH THREE—2-3-seater all-enclosed cabin high-wing monoplane. 120 h.p. inverted type Gipsy III engine. Range 440, 570 or 700 miles according to tankage, at cruising speed of 105 m.p.h. Landplane, seaplane or ski-plane. Price from £1,000.

GIPSY MOTH ★ MOT

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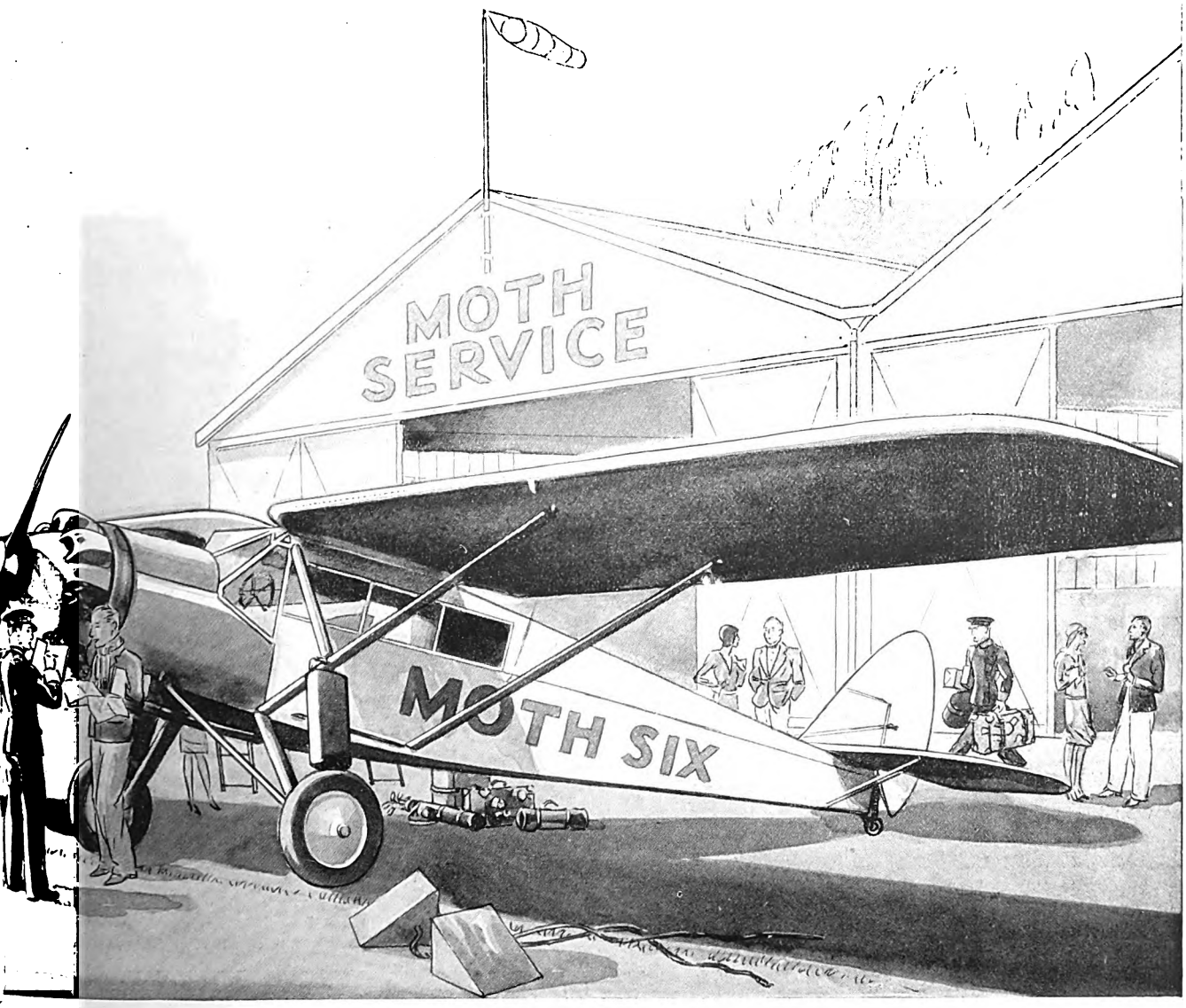

in the 1930 range

Uses: Private touring, aerial survey, taxi and air-line work, commercial purposes and mail carrying.

MOTH SIX—4-6 seater all-enclosed cabin high-wing monoplane. 240 h.p. geared Lynx or 300 h.p. direct drive Whirlwind J.6 engine. Range 300-560 miles according to tankage, at cruising speed of 105 or 109 m.p.h. with alternative engines. Landplane, seaplane or ski-plane. Price from £3,100.

Uses: Private touring, aerial survey, taxi and air-line work, commercial purposes and mail carrying. ALL PRICES NETT FLY AWAY STAG LANE AERODROME.

THE DE HAVILLAND AIRCRAFT CO., LTD., STAG LANE AERODROME, EDGWARE, ENGLAND
Associated Companies in Canada, Australia and India.
Licensees, Selling and Service Agents throughout the World.

THREE★ MOTH SIX

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THE CHOICE FOR ALL 'MOTHS'

A FEW 'MOTH' PERFORMANCES IN WHICH K.L.G. PLUGS PLAYED THEIR PART

Moths won the race for the King's Cup three years in succession, namely in 1926, 27 and 28. In 1929 a Moth with standard Gipsy engine made fastest time for light aircraft round the 1,100 mile course, averaging 118½ m.p.h.

World's Altitude Record for two-seater light aircraft with standard Gipsy engine. On July 25th 1928, Captain and Mrs. de Havilland succeeded in breaking the world's altitude record at a height of 19,980 feet.

World's Speed Record for two-seater light aircraft with standard Gipsy engine over a closed circuit of 100 kilometres. On December 7th 1928, Mr. Butler succeeded in averaging a speed of 119·4 m.p.h.

Captain Broad with Moth (standard Gipsy engine) won the Heavy Category in the Challenge International de Tourisme, 1929.

There is no need to refer to the efficiency of K.L.G. Plugs for it is sufficient that Messrs. The De Havilland Aircraft Co. Ltd., should have selected them.

Naturally, on the many wonderful "Moth" performances, K.L.G. Plugs were used.

Therefore, K.L.G. Plugs should be fitted by every light aeroplane owner, for performance — not promise.

K·L·G

PLUGS

A FEW 'MOTH' PERFORMANCES IN WHICH K.L.G. PLUGS PLAYED THEIR PART

Captain Broad with a Moth (standard Gipsy engine) won the Zenith Cup, 1929: a speed event round France.

The accomplishment by a standard Gipsy Moth of the 600 hour Reliability Tour in 1929, during which 51,000 miles were covered in the air with the engine completely sealed under A.I.D. supervision, in such a way that no attention could be given to the engine, other than purely routine maintenance, such as cleaning filters and plugs, adjusting tappets and contact breakers.

Australian East - West Race, 1929, Perth to Sydney, 4,500 miles. Gipsy engined Moths finished 2nd, 3rd, 4th, 5th and 6th. The Gipsy Moth which finished 2nd made fastest time irrespective of handicap, averaging 107 m.p.h. for 4,500 miles.

Mr. Frank Chichester, from England to Australia in his Gipsy Moth in 17 flying days.

K.L.G. SPARKING PLUGS, LTD., PUTNEY VALE, LONDON, S.W.15.

Sole Export Agents: S. Smith & Sons (Motor Accessories), Ltd. Cricklewood, London, N.W.2.

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A FLYING TEST OF THE GIPSY MOTH.

BY CHRISTOPHER CLARKSON.

By courtesy of the De Havilland Aircraft Co. Ltd. the writer has made flying tests in the standard metal-fuselage Gipsy-Moth with the Gipsy I engine and the latest model of the Gipsy-Moth with the Gipsy II engine.

The latter machine has in it a number of modifications other than those involved by the installation of the new Gipsy II engine.

Externally these modifications are not noticeable. They include the adoption of a new wing-section, known as the R.A.F. Training Type, which is very similar to that in the Genet-Moths which were supplied to the Central Flying School, the carrying of the exhaust pipe down the front of the fireproof bulkhead, and out below the floor of the fuselage and the fitting of a new design of windscreen.

The machine is also fitted with parachute seat and Sutton harness, and a turn-indicator is included on the instrument-board. The new wing-section is preferable to the type in use on the standard Gipsy-Moth. All the flying qualities appear to be just as good, the performance is improved and the machine is better for aerobatics.

In addition, the actual stall is not as violent as with the other machines.

The Gipsy II engine has a longer stroke, a more efficient head with larger valves, and an all-enclosed valve-gear. This latter improvement reduces the wear on these parts and gives more silent running.

Various bearing surfaces have also been enlarged and this should lengthen the life of these parts. The nominal output of this engine is 100/120 h.p.

The following are the makers' performance specifications for the two types, which relate to machines loaded to 1,400 lbs., that is, with pilot, passenger and full tanks.

	Mark I.	Mark II
Top speed at ground level	100.5	107 approx.
Cruising speed at ground level ...	85 at 1,800 r.p.m.	90 at 1,900 r.p.m. approx.
Climb speed at ground level ...	710 ft./min.	1,050 ft./min.
Climb to 5,000 ft.	8½ mins.	6½ mins.
Climb to 10,000 ft.	22 mins.	13½ mins.
Glide...	1 in 8½	1 in 8½
H.P.	85/100	100/120
Petrol consumption at 85 m.p.h. ...	5.2 gals./hr.	5.2 gals./hr.
Range	310 miles	310 miles
Tare weight with slots	980 lbs.	990 lbs.

There is interest in comparing the performance of these two machines and in noticing how nearly the figures found in actual air test compare with those issued in the maker's specification,—an agreement which is not always found.

Such figures as are given below, although taken as accurately as possible, cannot be expected to agree with those taken under ideal conditions by the R.A.F. at Martlesham Heath or by the company's test pilots. Nevertheless they may be taken as a useful guide to intending purchasers, as they show what they themselves may expect to get under normal flying conditions.

PERFORMANCE.

The first thing that strikes one when flying the new Gipsy-Moth is its superiority as regards performance. The take-off especially is quick and clean and the increased power enables one to climb at once at quite a steep angle. The tests with both types were made without a passenger.

The standard Moth had Handley Page automatic slots whereas the new one was not so fitted.

Climb.—A timed climb on both machines gave the following results:—

Height reached in 5 mins.—Mk. I 3,200 ft., Mk. II 4,400 ft. Height reached in 10 mins.—Mk. I 5,500 ft., Mk. II 7,200 ft.

Top Speed.—Standard Moth (Mk. I), 98 m.p.h. at 2,000 r.p.m. New Moth (Mk. II), 106 m.p.h. at 2,200 r.p.m.

Cruising Speed.—Standard Moth (Mk. I), 88 m.p.h. at 1,850 r.p.m. New Moth (Mk. II), 95 m.p.h. at 1,950 r.p.m.

Take-off.—The new type shows a great improvement over the standard machine and has a remarkably quick take-off.

Landing.—The new type is more pleasant to land than the standard type. It appears to float farther as one flattens out, there is less tendency for it to sink suddenly onto the ground and it shows no tendency to drop a wing. The landing speed and ensuing run appear to be the same on both machines. The angle of glide is flat with plenty of control in both.

Controls.—On both machines the controls are well balanced, and are moderately light and efficient at all speeds. The ailerons show the approaching stall as well as on any other modern machine of this type, and remain the most efficient of the controls at very slow speeds. All are satisfactorily progressive as the speed increases. There was a tendency for the lateral control on the new type to be

THE TRAINING TYPE MOTH.—A Moth with the Gipsy II engine and R.A.F. Training Section wings piloted by Mr. Christopher Clarkson (late instructor at the Central Flying School, R.A.F.).—(*"Aeroplane" photograph.*)

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slightly heavy during aerobatics, but this was due to the adjustment of the differential on that particular machine.

Stalling and Spinning.—The standard Moth with automatic slots was very efficient at slow speeds and the lateral control remained even when the machine was sinking rapidly. When this machine was properly stalled on a turn the ensuing drop and "whip" was rather pronounced, and some height was lost before complete control was regained. The machine could be spun both ways if forced in.

On the new type, which was not fitted with slots, the ailerons remained efficient at low speeds and there was far less tendency for the machine to "whip" when stalled. It sank gently and it was possible to regain control almost immediately without undue loss of height. It could be spun both ways, and a quick recovery to level flight could be made. Even without slots this machine appeared to be the more satisfactory of the two types. On both machines aileron drag was scarcely perceptible.

Aerobatics.—Both types are suitable for aerobatics. The new type was particularly good for the more advanced aerobatics and the increased power, Sutton harness and the different wing-section makes it effective for inverted manœuvres. This type was easy to slow-roll and handled well in inverted flying.

COMFORT.

Both machines are comfortable to sit in and are fairly free from draughts. The new type windscreen is much more effective than that used on the standard type The controls are well positioned, with the possible exception of the petrol-cock, which is rather difficult to reach when the pilot is held in with shoulder straps.

There is an absence of noise and vibration. This is most noticeable in the new type, as the Mark II engine runs very smoothly and the new position of the exhaust reduces the note as heard by the pilot.

The instruments are well arranged, with the possible exception of the compass, which is hidden by the control column. The turn indicator is a great improvement.

The view from the back seat is quite good and is improved on the new type by the absence of the side exhaust pipe, and by the new type windscreen. From the front seat the view on both types is moderate.

Both machines have steerable tail-skids and handle well on the ground. They are easy to taxi and are light to lift round by hand. The engine and controls are accessible and should require the minimum amount of attention.

The finish and appearance of both machines are excellent. The spares which are available and the service which goes with these machines are too well known to need mention here. The writer doubts whether any other aircraft firm in the World has taken this matter in hand as thoroughly as have the De Havilland Company.

SUGGESTIONS.

In all humility one suggests that, in a still newer type, adjustable seats would be a great improvement. This fitting is becoming more and more popular and on military aircraft it is essential.

As the Gipsy-Moth is fast becoming a standard military training aircraft for Air Services all over the World the argument in favour of this fitment is more convincing. In any case it has great advantages, both as regards comfort and the ability to obtain a better view if circumstances suddenly require it.

The compass and petrol-cock positions might be improved and a check-cable on the Sutton harness should be fitted to limit the forward movement of the pilot's shoulders.

GENERAL CONSIDERATIONS.

As may be seen from the foregoing the new type Gipsy-Moth shows a distinct all-round improvement over any previous type of Moth. Considered purely as a training machine an additional advantage is its increased rate of climb, an essential feature if valuable time is not to be lost over instruction.

The fact that the stall is of a milder type might, under some conditions, make all the difference between a fatal and a non-fatal accident. The controls should not give a pupil any wrong sense of proportion, and he can be taught aerobatics without undue loss of time, height or temper.

For the private owner who wants something rather more than a touring machine or for a pilot who feels that he wants a higher performance than that which is offered by the standard type the new Moth with the Gipsy II engine should be a great attraction.

ACCESSORIES BEFORE THE FACT.

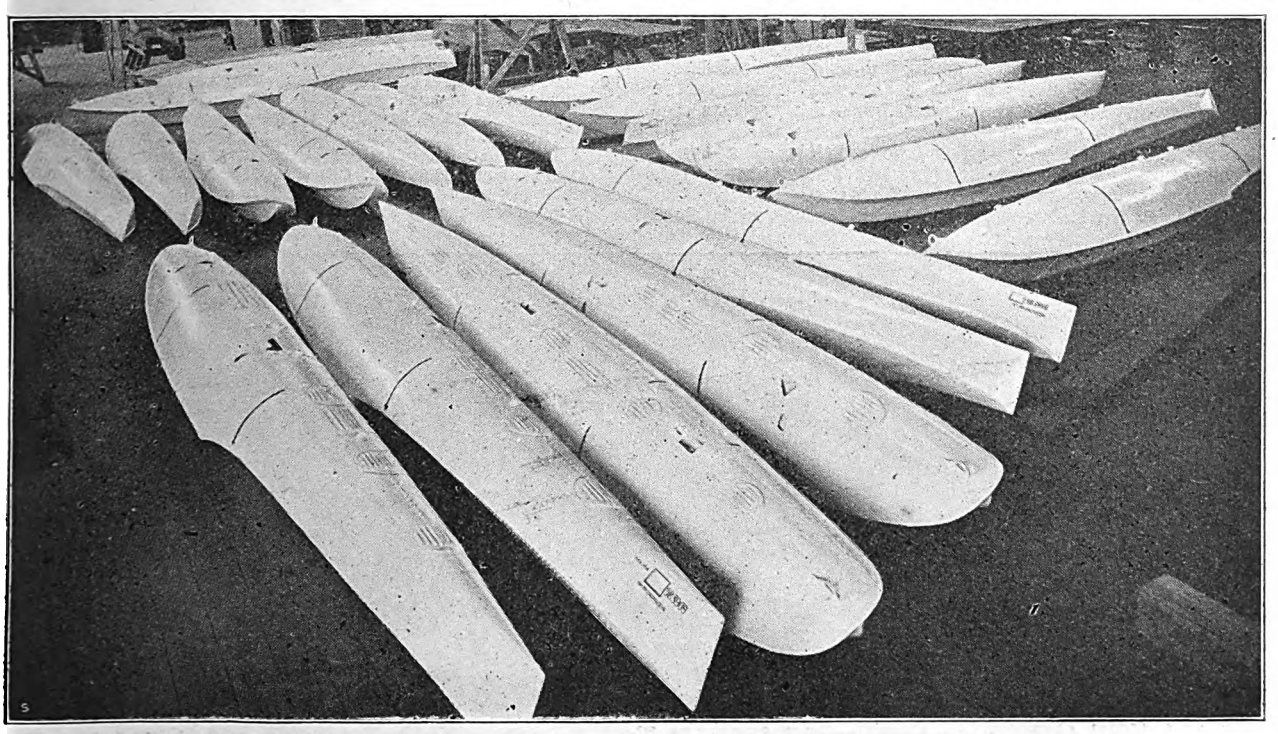
SHORT FLOATS.

Short Brothers (Rochester and Bedford) Ltd. are nearly as well known as makers of seaplane floats as constructors of all-metal flying-boats. They make floats for all types of aircraft, from the Light Aeroplane to Schneider Trophy racers, and a surprisingly large number of D.H. Moths have been fitted with float undercarriages by Short Brothers Ltd.

Short floats for the D.H. Moth, besides being remarkably "clean" on the water, are exceptionally good aerodynamically. They add but slightly increased drag and affect the performance of the machine very slightly. The top speed is lowered from 103-105 m.p.h. to 98 m.p.h., and the disposable load decreases from 788 lbs. to 680 lbs. (normal C. of A.).

Short floats have given consistently good service all over the World under the most adverse conditions, for which their all-metal structure and careful workmanship especially fit them.

As is generally known, Short floats are made from duralumin sheet. The bulkheads are pressed to shape and then



FLOATS FOR MOTHS.—A batch of duralumin floats made by Short Bros. Ltd. awaiting delivery.

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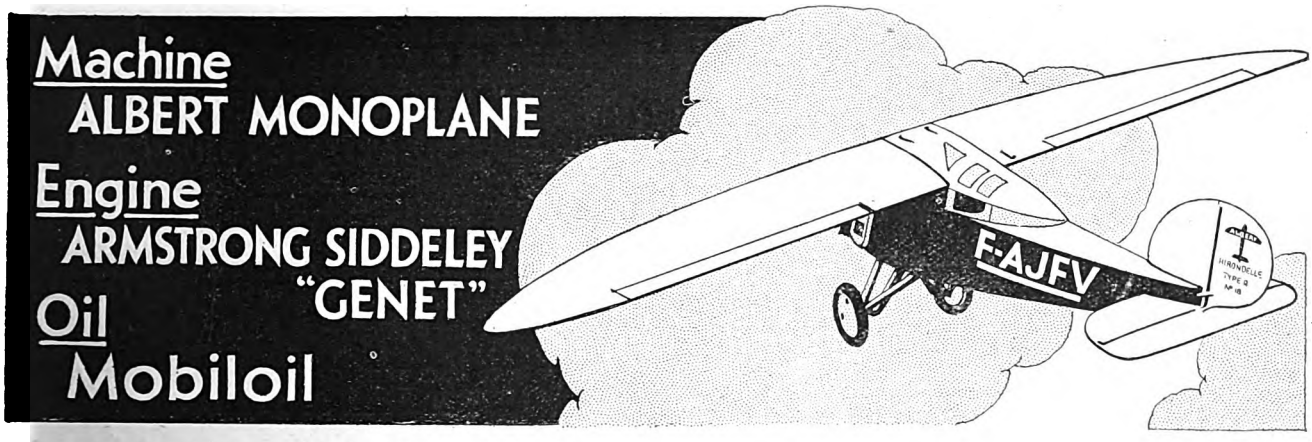

World's Altitude Record for Light Aeroplanes

On February 11th, M. Albert, in his monoplane fitted with an Armstrong-Siddeley Genet engine set up a new altitude record for light aeroplanes of a weight unladen of 350 kgs. by climbing to 7,730 metres.

Mobiloil again proved its remarkable properties. Temperature conditions varied from between +10°C. to −20°C. at 5,000 meters to −35°C. at the maximum altitude. **The oil pressure remained constant throughout.**

Mobiloil is recommended by the makers of the following aeroplane engines:

Bristol
Cirrus
D.H. Gipsy
Genet
Hermes
Jaguar
Leopard
Lynx
Mongoose
Salmson

FOR SAFETY & RELIABILITY USE

Mobiloil

REGD. TRADE MARK

VACUUM OIL COMPANY, LTD., CAXTON HOUSE, LONDON, S.W.1

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HANDLEY PAGE AUTOMATIC SLOTS.

When the Moth was produced private flying as such was comparatively unknown. The first uses to which the Moth was put were for training by the Flying Clubs and some Governments, and certain commercial uses, such as forest patrol and light transport work in Canada. In February 1928 the Handley Page slot was installed on the Moth.

At the first public demonstration of the slotted Moth Capt. Geoffrey de Havilland flew the machine in what would have been considered a dangerous fashion on an unslotted machine. In his final stalled landing the machine sank on an even keel from 200 feet, and broke its back between the front and rear cockpits by the rear undercarriage legs being forced up through the longerons.

Without slots the machine would have fallen out of control on being stalled, and from the height from which Capt. de Havilland descended with safety to himself there is no doubt that considerable damage would have been done with the almost certainty of serious injury to the occupant.

Several other demonstrations were given in which pilots made deliberate errors of judgment without serious results. The resultant publicity from these remarkable practical exhibitions of how to crash in safety brought the possibilities of flying before the man in the street most graphically.

As the result of these demonstrations a special slot equipment was developed for the Moth and the automatic slot was listed as an extra to be fitted if required.

A very large proportion of the output of the Moth since 1928 has been slotted, and the extraordinary safety which is prominent in the original design of the Moth has without doubt been added to by this safety device.

The Moth normally has control almost right up to the stall of sufficient power to deal with the initial stages of a spin. The slots on the Moth have been designed to open slowly between 50 and 60 m.p.h., and their function is to reduce the tendency for a stall to develop into a spin.

In this they are successful, and their presence has more than once given a pilot sufficient confidence to try to make a forced landing in what would normally be an impossible landing space rather than to stretch a glide and crash hopelessly.

METAL PROPELLERS.

One of the most interesting of recent light aeroplane developments is the series of light aeroplane airscrews evolved by Metal Propellers Ltd. This company built its first metal airscrew in 1917, and the construction of the light airscrews is identical to the system evolved by the company for their large airscrews.

The airscrew consists of two hollow blades, which are assembled into a central hub. The pitch of the blades is rapidly adjustable, and this enables the owner to modify his airscrew according to whether he needs a maximum rate of climb, maximum air speed or intends to operate his aircraft from a tropical aerodrome. Each blade is built up of two composite laminated sheets of S3 steel, one forming the pressure and the other the suction face. Only the outer lamination in each sheet extends the full length of the blade. The blade is formed by welding the two sheets together along the edges.

The bi-convex section used does away with the need for any internal strutting. The blades are durable, free from corrosion and do not warp.

These airscrews are also generally found to be smoother running, which is probably due to the exceptional freedom from flutter afforded by the bi-convex section.

A further advantage claimed for these airscrews is their lightness. The Cirrus model weighs 23½ lbs., complete with hub. If a spare is needed the owner need only carry one blade instead of a complete airscrew.

A model has been evolved for both the Gipsy and the Cirrus engines, and the makers are at all times willing to give demonstrations to interested persons.

FAIREY METAL AIRSCREWS.

The Fairey Aviation Co. Ltd. has a very large department engaged on the design and construction of metal airscrews under the patents of Dr. S. A. Reed.

The advantages of a metal airscrew are many. There is no distortion due to extremes of climate, it is impervious to rain, hail or spray, and in the event of an accident, in which in most cases the airscrew suffers, the blades can be bent straight and re-set.

A standard Fairey airscrew is made for the Gipsy-Moth, as for all the popular makes of light aircraft, and Fairey airscrews have been used on a number of the successful accomplishments in British aviation.

WOODEN AIRSCREWS.

The Airscrew Co. of Weybridge, Surrey, is the pioneer firm of airscrew manufacturers and makes airscrews ranging from 6 ft. 6 in. Cirrus and Gipsy screw to the 16-foot screws on the airship R.101.

A special portion of the Weybridge Works is set aside for the manufacture of screws for light aeroplanes. A very large proportion of the long distance flights made in the last twelve years have been done with screws made by this company and large numbers are in use all over the World, where they are giving satisfaction under every kind of climatic condition.

SMITH'S INSTRUMENTS.

The instrument equipment of the Moth-Three is being supplied by Smith's Aircraft Instruments, and consists of the usual range—altimeter, pressure gauge, air-speed indicator, revolution indicator, with flexible drive and a cross-level. In addition, a new oil thermometer is provided and an 8-day clock (with an inner dial and pointer, which can be set to show the duration of flight) is included.

Another feature of the dashboard is the Mk. IIIa Husun Aperiodic Compass, which is now fitted as standard. This compass has a rotatable verge ring, divided into 360 degrees in 2-degree intervals, and carries four parallel grid-wires. The ring is turned so that the N—S-pointer, which is painted red, is seen parallel to any one of the wires. This enables the compass to be placed in any convenient position, either in front or at the side of the pilot.

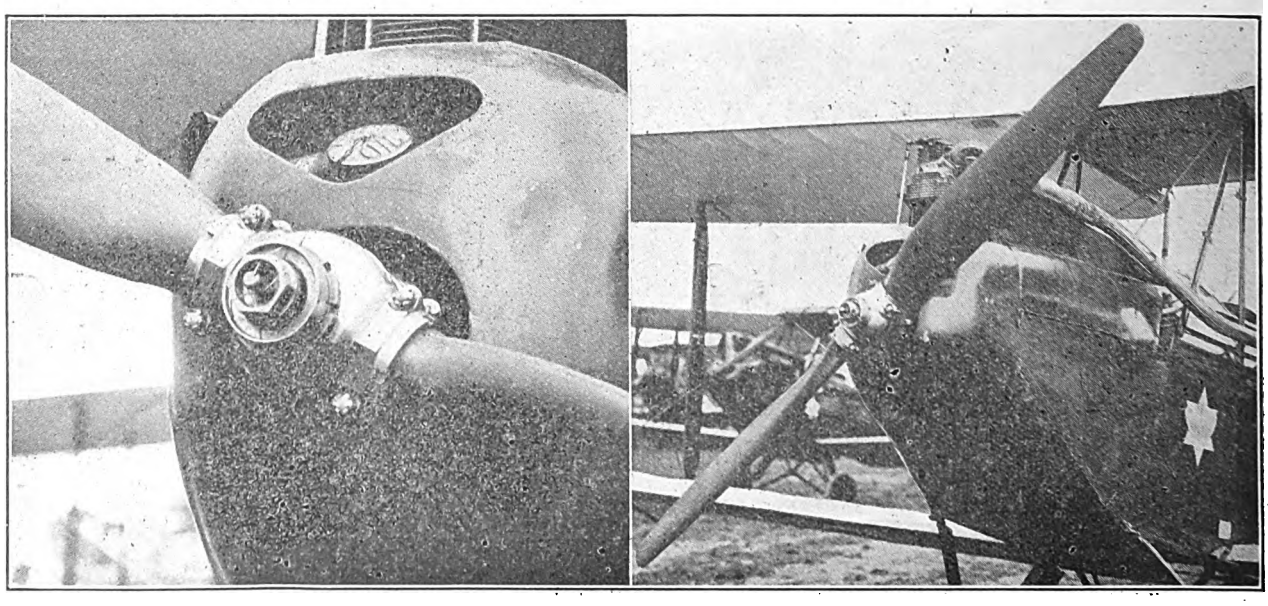
The diameter of the compass is approximately 4 inches and it weighs only 2½ lbs. A special suspension system reduces vibration and landing shocks to a minimum.

COMPASSES FOR LIGHT AIRCRAFT.

Kelvin, Bottomley and Baird Ltd., of Glasgow and London, are the pioneers of compass-making, and their association with Aviation dates back to the earliest flying days. K.B.B. compasses were used in large quantities during the War 1914-18, and since then considerable strides have been made in their improvement.

Of the big range of K.B.B. compasses made, the K.B.B.3 and the K.B.B.3A are produced in a small size for light aircraft. These are generally known as the "Baby" models.

These compasses are provided with inverted pivots, that



THE METAL AIRSCREW.—Two views of the airscrew made by Metal Propellers Ltd. on a Cirrus-Moth.

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Supplied to

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VICKERS (PATENT) FUEL COCKS (LIGHT PATTERN)

VICKERS FUEL PUMPS HAND OPERATED AND WIND DRIVEN.

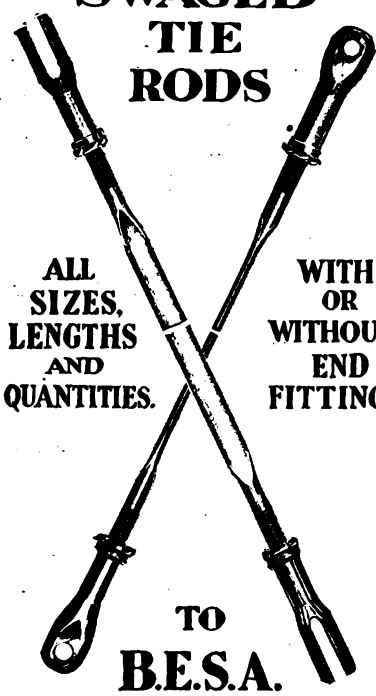
FOOT VALVES. NON-RETURN VALVES.

FUEL FILTERS. RELIEF VALVES.

VICKERS-DAVIS NAVIGATION LAMPS (LIGHT PATTERN)

"MALLEVILLE" ADJUSTABLE PIPE CLIPS.

STREAMLINE WIRES AND SWAGED TIE RODS



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WITH OR WITHOUT END FITTINGS.

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is, the pivot point is carried by the moving system with the jewel in the upstanding pillar.

For civil aviation a direct-reading compass, in which the magnet system carries a graduated card, is a great advantage. In the K.B.B. compass the readings are taken from the forward side as in a ship's compass, so that all readings are natural and not reversed.

This compass may be mounted on the dashboard, but a floor mounting is recommended. When used like this the aperture bowl is closed by an inclined plano-convex lense, which enables it not only to be much magnified but to be read at any position from nearly vertically above to a line of sight about 30 degrees from the horizontal.

For night use these compasses may be either electrically illuminated or treated with radium.

When treated with radium the four cardinal points and the lubber point are indicated by clearly recognisable symbols, as it has been found difficult to make small figures and letters distinguishable in the dark at a distance. Each 30 degrees is shown by a luminous mark, so that a very simple and distinguishable card is obtained in so small a size.

Actually the card is only 1½ inches in diameter before magnification, and this small size is responsible for its remarkably quick deadbeat action in the machine. If it is deflected 90 degrees from the meridian and released it returns to the meridian in 5½ seconds, overswings by 7 degrees and promptly returns to equilibrium.

IRVING AIRCHUTES.

So many private owners of light aircraft are adding the parachute to their flying equipment that the standard metal-fuselage Gipsy-Moth is being produced with special seats to accommodate the Irving seat pack parachute. In wooden-fuselage Moths these seats may be fitted when requested.

The new seat is lower, slightly larger and curved and flanged to suit the shape of the Irving pack. A section is indented in the bottom of the seat to fit the protector flap over the parachute locking device. These modifications make no difference to the position of the pilot. When he is not wearing the parachute he uses a special air-cushion provided by the De Havilland Company.

The experience of the Royal Air Force with D.H. Moths has shown that the Irving seat-pack is admirably suited for use with light aircraft. The pack is small and compact and weighs only 18 lbs.

MAPS.

Edward Stanford Ltd., of Whitehall House, 29-30, Charing Cross, S.W.1, the well known cartographers, have produced a very large series of maps suitable for the air traveller.

They publish the quarter-inch scale Ordnance Survey Maps, mounted on card and eyeletted round the four edges. With hinged rings these can be joined together, either North, South, East, or West, to suit the requirements of the pilot and his route, or they may be used separately. The map sheets are treated with the company's patented "Lutra" process, which makes them impervious to weather, oil and petrol. With a special grease pencil, which is provided with the maps, routes, distances, etc., may be marked on the maps, and on the termination of the journey these marks can be easily removed without injury to the maps.

A four-mile Civil Air Edition Map of England and Wales is in preparation by the same process.

The company will also prepare maps for any particular purpose and for any country, and these can be marked with routes, distances, magnetic courses and positions of aerodromes. Certain standard Continental maps on loose-leaf cards and mounted in folders are already prepared.

Other accessories made by the firm are an "Aero" map-carrier, specially made to hold their standard maps and to be fixed in the cockpit of an aeroplane, a special Roller map case for strip-maps, a pilot's Knee Writing-Pad, complete with paper and pencil, and all kinds of navigational accessories, such as slide-rules, protractors, compasses, etc.

Stanfords have prepared maps for a large proportion of the well-known long-distance flights made during the past few years. These include the London—India flight of Messrs. Stack and Leete, Lady Bailey's flight from England to South Africa and back, the England—South Africa flights of Lieut. Bentley, etc.

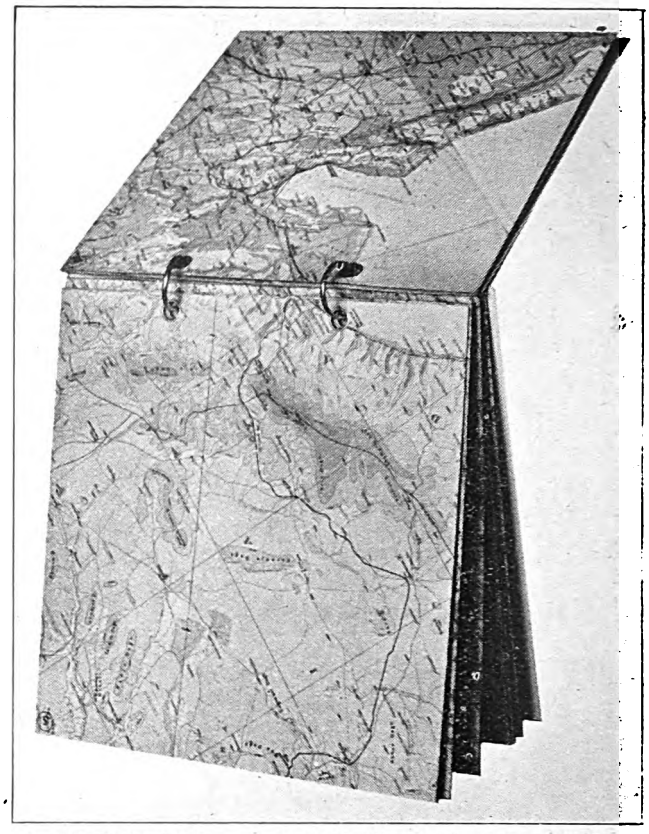
All possible users of maps for air touring are invited to visit the company's showrooms.

DUNLOP WHEELS AND TYRES.

The Dunlop Company, whose history is that of the Pneumatic Tyre Industry, has developed through long experience the appropriate type of tyre for every form of transport.

The name Dunlop is universally associated with pneumatic tyres and rims of the wired-on type. The Dunlop Aero Tyre and Rim, which incorporate this feature, has been developed for aircraft purposes.

The principle of this tyre involves the use of inextensible wire rings in the edge of the tyre smaller than middle of the rim itself. This necessitates a simple fitting operation.



A FLYING MAP.—A typical Stanford map showing the loose-leaf form of mounting.

To fit the tyre to the rim one edge of one side of the tyre is pushed into the well of the rim and by the eccentricity so obtained it is possible to manipulate the remainder of the cover edge into position. The operation is repeated for the other side of the cover.

It is not possible to reproduce by accident the operations required to fit the tyre so that there is no possibility of the Dunlop Aero Tyre becoming detached from the rim, however severe the landing conditions, or in spite of any loss of pressure that may occur.

The 4 in. by 15 in. (600 by 100) Dunlop wheel and tyre are standard for the D.H. Moth.

The latest development of the Dunlop Company is the patent Light-Alloy Disc Wheel, and this is an optional fitment on the Moth. This wheel is 2 lbs. 10 oz. lighter than the standard wheel.

PALMER WHEELS AND BRAKES.

Palmer Tyre Ltd. are pioneers in the manufacture of wheels and tyres for aircraft. They began research work in 1913, and by the time of the outbreak of the war 1914-18 they were in a position to supply special aero-wheels and tyres to suit the types of aircraft then being produced.

From this small beginning grew the immense organisation which supplied wheels and tyres for practically every aircraft built during the war. That these wheels were evolved on correct principles is proved by the fact that the present Palmer wheel is still fundamentally the same.

The Palmer Company supplies special wheels for the Moth. These are No. 186 with 600 by 75 tyre for speed work, No. 188 and No. 333 with 600 by 100 tyre for standard use, and No. 188 with 650 by 125 oversize tyre for use on soft ground and in the Colonies.

Palmer wheels were used on the Moths which won the King's Cup in 1926, 1927 and 1928 and the Siddeley Trophy in 1928 and 1929. Several long-distance flights, including the pioneer flight from England to India by Messrs. Stack and Leete, have also been made on Palmer wheels.

The above tyres can, if desired, be equipped with the Palmer Aircraft Brake.

This brake is of the fluid pressure type and consists of an annular expansion chamber to which are attached a complete ring of brake-blocks, which, when the brake is in operation, are forced into frictional contact with the drum.

This brake may be operated either by air or by oil, but the latter is intended for light aircraft as the installation is simpler and lighter.

Pressure on the foot-pedals mounted on the rudder-bar forces oil to flow from a small container into the annular chamber and expand it. When the brake pedals are released oil flows back into the container. A reserve of oil

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PALMER *for* MOTH!

Moth owners are advised to fit these

PALMER LANDING WHEELS & TYRES

Wheel No. 186, with 600 x 75 tyre. For speed work. Extremely light and perfectly stream-lined.

Wheel No. 188, with 600 x 100 tyre.
Wheel No. 333, with 600 x 100 tyre. For standard use. Strength for strength are the lightest units of their size.

Wheel No. 188, with 650 x 125 oversize tyre. Particularly recommended for use on soft ground and in the Colonies.

Of especial interest to Moth owners is

THE PALMER AIRCRAFT BRAKE

which resolves the numerous problems connected with taking off or landing in confined spaces. Every flying man should obtain a copy of our brochure in which the Palmer Aircraft Brake is fully described and illustrated. Free on request.

For safety and efficiency fit

Aircraft Wheels, **PALMER** Tyres & Brakes

THE PALMER TYRE LIMITED,

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PLYWOOD.

Nachman Kremer and Sons Ltd., of 10-11, Hill Street, London, E.C.2, are manufacturers of the well-known "Kremply" plywood which is used by the leading British aircraft manufacturers. This plywood is made in their London factory and can be supplied in all sizes.

The company also manufacture an armoured plywood known as "Kremore." This is ordinary plywood faced on both sides with either stainless steel, monel metal, aluminium, galvanised steel or copper sheet. It can be used for practically any purpose, is easily worked and is impervious to all destructive agents. The company will be pleased to supply full particulars of their products to all firms interested.

B.T.H. MAGNETOS.

The magnetos used on the D.H. Gipsy III engine are of the AG4-4 type manufactured by the British Thomson-Houston Co., Ltd., Coventry. These magnetos are in essentials suitable for all the four-cylinder Gipsy and Cirrus engines. They are lightweight, base-mounted, rotating-armature machines of simple, compact and robust construction.

The base, distributor end-plate and driving end-plate are die-cast in aluminium as a single unit, and are integral with the laminated poles. Not only does this give an exceedingly rigid and robust mechanical structure, but it also ensures accurate alignment.

As the distributor is of the "jump spark" type, distributor tracking troubles are avoided, and in consequence all that is necessary is to clean the distributor track very infrequently.

The safety spark-gap is of the rotary type. It is mounted on the distributor-gear wheel assembly. This ensures reliability, as undue ionisation is prevented.

Nickel is used for the distributor segments and distributing electrode.

The design of the contact-lever bearing-brush and contact-lever heel is such as to ensure long life and to provide against seizure troubles. Very accurate formation and spacing of the cam-segments is achieved by machining them from a continuous cam ring. This construction does away with the liability of the segments to be displaced relatively to one another. Contacts are of iridio-platinum, which is the most suitable material for the contacts on magnetos.

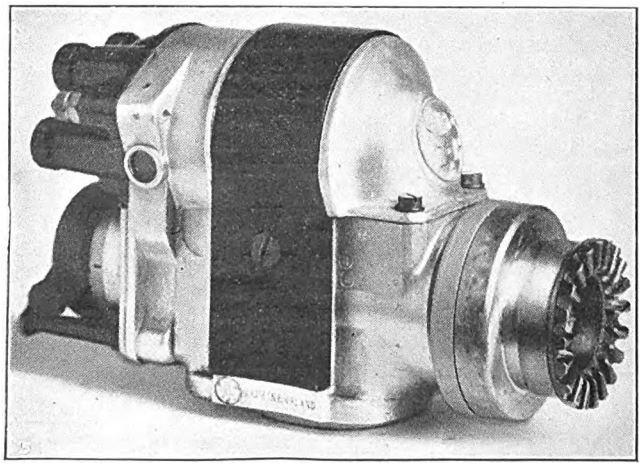
Another feature concerns the condenser. This consists of a large number of thin sheets of mica and tinfoil held together by means of clips. This construction does away with the necessity of drilling the plates after the condenser is assembled, with the likelihood of cracking the mica.

An impulse-starter is incorporated in the magneto, the function of which is to simplify the problem of engine-starting and enable any size of engine to be started with comparative ease under the worst conditions. This device consists essentially of two members, the driving member, which is coupled to the magneto driving-shaft of the engine, and the hub assembly, which is rigidly secured to the magneto spindle. The hub carries two pawls, one end of which engages with a cam profile machined on the inside face of the driving member, the driving member and hub assembly being linked together by a stout helical spring. A special end-plate is fitted to the driving-end of the magneto and is provided with a stop.

The action of the impulse starter is as follows:—

When the driving member is rotated, one of the pawls will reach the top position and as it is free to drop it will engage with the stop on the end-plate. The armature and hub assembly are thus locked, and held stationary.

Further rotation of the driving member will cause the helical spring to be wound up, and an angular displacement will take place between the driving member and hub assembly.



The B.T.H. A.G.4-4 magneto as fitted to the Gipsy engines.

At a pre-determined position the cam on the inside face of the driving member engages with the outer end of the pawl and forces it inwards.

This disengages the pawl from the stop in the end-plate, and, owing to the winding up of the spring, the hub assembly together with the armature receives a sudden impulse. The magneto is timed so that the contacts separate during this very rapid "flick over," and an intense spark is thus automatically produced.

The pawls are so weighted that the heavy ends are thrown out by centrifugal force and automatically clear themselves from further engagement with the stop on the end-plate as soon as the engine accelerates. The speed at which this occurs is about 160 r.p.m. magneto speed.

As soon as the pawls cease to engage, the two members, i.e., the driving member and the hub assembly, rotate as a single unit.

As two pawls are fitted two impulses are obtained every revolution of the magneto shaft.

ZENITH CARBURETTERS.

Zenith carburetters have been associated with the Aero-Engine Industry since its inception and in the intervening period have made a reputation that is well known all over the World.

The Zenith 48 R.B. carburetter is standard in the D.H. Gipsy engine and this important accessory helped to make aero-engine history when through its aid the Gipsy engine completed the 600 hrs.' reliability test last year with no trouble whatever.

K.L.G. SPARKING PLUGS.

K.L.G. Sparking Plugs Ltd., of the Robinhood Engineering Works, Putney Vale, S.W. 15, have produced a special light plug known as Type 294, which is particularly suitable for the Gipsy and Cirrus engines.

This is a miniature plug, and in addition to giving a greatly improved performance this plug is noteworthy for the saving of weight and over-all dimensions obtained.

The projection of the plug from the cylinder has been reduced by ¾ in., which helps the design of the engine cowling, and the reduction in weight actually represents a saving of over 3½ lbs. in a normal 12-cylinder engine.

The greatest difference between the construction of this special plug and that, for instance, of the older F.12 type, is in the method of securing gas-tightness.

In the F.12 type plug this was done solely by the compression of the assembly of mica washers between the head on the inner end of the electrode and the external nut. The heavy compression necessary resulted in the electrode itself being severely stressed. In many cases the head of the plug distorted under heat and in relieving the compression allowed leakage which destroyed the insulation.

In the type 294 "gas-tightness" is ensured permanently by contracting a central gland onto the insulating wrapping between a top and bottom assembly of mica washers and so preventing leakage by a local nip on or about the centre of the electrode. By this method no reliance is placed on the compression of mica washers and the electrode is subjected to no stress.

There is no need to refer to the efficiency of the 294 in service. This plug is a standard plug for the Gipsy and Cirrus engines.

LODGE PLUGS.

Lodge Plugs Ltd., of Rugby, have produced a special plug known as the Model A-50, with a small diameter (12 mm.) thread.

A high efficiency engine of the Gipsy type subjects sparking plugs to a wide range of strenuous conditions. The design, material used, and the general construction of the A-50 plug are obviously the best obtainable, and this plug has gone through a 100-hours' observed type test in the Gipsy engine without any renewal or even cleaning and adjustment.

For the Cirrus and Hermes engines the Lodge standard A-21 (18 mm. thread) long-reach aviation plug, which has full Air Ministry approval, is used and approved by Cirrus Engines Ltd.

The well-known reliability of Lodge plugs in all types of internal-combustion engines ensures that users of Gipsy, Cirrus and Cirrus-Hermes engines need have no cause for uneasiness when flying with the aid of these plugs.

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In the Air . . .

. . . as on land and water Zenith always scores!

The ZENITH CARBURETTER IS STANDARDISED on the GIPSY MARK II engine — British Made

The ZENITH CARBURETTER CO. ***specialise in carburetters for all types of internal combustion engines***

Engine Designers are invited to avail themselves of the highly specialised knowledge of the Research Staff of the Associated Zenith Carburetters Companies who are always glad to design carburetters and induction systems for any new or existing type of aircraft engine. Let Zenith solve your carburation problems.

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for every engine!

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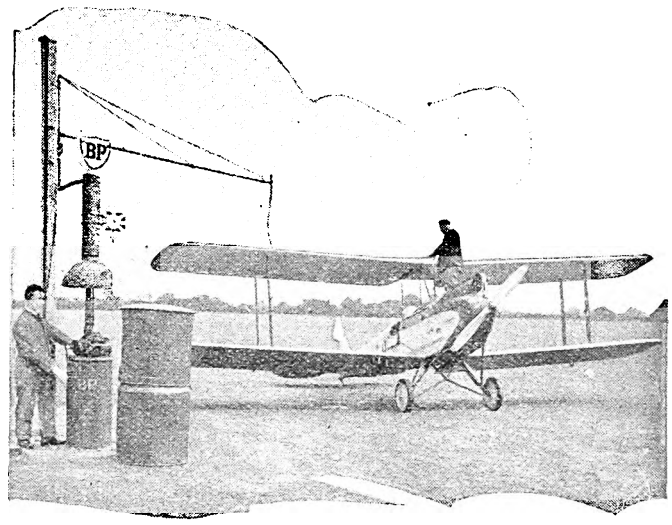

The new "BP" ~puts new life in your engine!

ANGLO-PERSIAN OIL CO. LTD
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GOODYEAR AIRWHEELS.

The Goodyear Tyre and Rubber Company, which company was largely responsible for the introduction of the low-pressure tyre for road transport, have produced a range of low-pressure airwheels for aircraft which have produced some very interesting results.

The Goodyear Airwheel is a large air-volume tyre with a cross-sectional diameter close on half its wheel-diameter. Rims, spokes and wheel-framework generally have been eliminated so that the entire wheel consists only of a full balloon-cover mounted directly onto the hub.

This wheel, the general appearance of which can be gathered from the attached illustrations, has been tested in American wind-tunnels and has shown that it produces less drag than the ordinary tyres and wheels which they replace.

This fact has been confirmed by tests made at the U.S. Air Corps Experimental Station at Wright Field, Dayton, Ohio, and also in many flying tests over a measured course.

A 22 by 10 Goodyear Airwheel, which size is suitable for the Gipsy-Moth and other similar size light aircraft weighing approximately 1,700 lbs., has been proved in America to produce 25 per cent. less drag than an ordinary 30 by 5 faired wheel, which size it replaces.

In various speed-tests made in America on three different makes of aircraft an average increase in speed of 5 m.p.h. was obtained with this size of wheel over the corresponding size in ordinary spoked and faired wheels.

The same size wheel has been tested in the wind-tunnel of Boulton and Paul Ltd. In these tests the drag of the wheel at 100 ft. per sec. was 3.566 lbs.

This type of wheel is claimed to possess many notable advantages. In the first place, as the Airwheel has no rim, spokes or other framework it cannot collapse under severe drop or side-wind landings. Even when punctured or badly cut the damaged tyre takes the greater share of the strain and serves as a cushion. The hub continues to turn without hindrance and provides a rolling contact with the ground, regardless of the condition of the Airwheel.

Tests have been made with a machine equipped with a pair of 22 by 10 Airwheels, one of which had been cut through casing, fabric and inner tube for five inches. All sorts of take-offs and landings were made in all sorts of weathers, but at no time did the machine show any tendency to slew round, as is common with deflated high-pressure tyres, except during the last few feet of run.

Efforts were made to strip both the inflated and the punctured Airwheels from their hubs, but this could not be done.

The makers claim that in a take-off an Airwheel offers less resistance because the low pressure allows it to swallow bumps and obstacles instead of being lifted over them.

The large sectional diameter of the Airwheel allows an increase in pressure of approximately 80 per cent. at the time of landing impact. This building up of pressure assists in stopping and softening the impact shock.

Owing to the increase of the width of tread, as the Airwheel cushions on landing an aeroplane can make safer contact on soft ground, snow, sand and rough surfaces, and, as with the take-off, obstructions such as stones, cross-furrows, etc., are absorbed by the tyre and do not tend to deflect the machine from its course or trip it up.

The Goodyear Company have two machines of their own on which they are testing out the Airwheel. One of these, a Fokker Universal, which weighs 5,400 lbs., has had the shock-absorber legs removed and replaced by rigid girders. This machine has been fitted with a pair of 37 by 16 Airwheels inflated to 7 lbs. pressure, which act as the sole shock-absorbing medium.

This machine has passed all the American Department of Commerce tests, which call for a 24-inch drop during which no greater force than six to seven times the static load shall reach the undercarriage or fuselage without the tyre ever bottoming on the rim, let alone damaging the landing gear or fuselage.

This cleaning up of the undercarriage from the point of view of resistance, as well as maintenance, coupled with the reduced drag obtained with the Airwheel, are features well worth studying.

SPRINGS.

Geo. Salter and Co. Ltd. of West Bromwich are manufacturers of springs of all kinds. This company has had longer experience in the making of springs for aircraft purposes than any other firm. It has a department specially devoted to the manufacture of these springs and it is continually making extensive research. They make springs of all sizes, ranging from the smallest valve spring to very heavy pattern springs for landing gears.

The Gipsy engine which completed an endurance test of 600 hours was fitted with Salter valve springs, and when the engine was dismantled the springs were found to be in perfect condition and still working within the tolerances allowed.

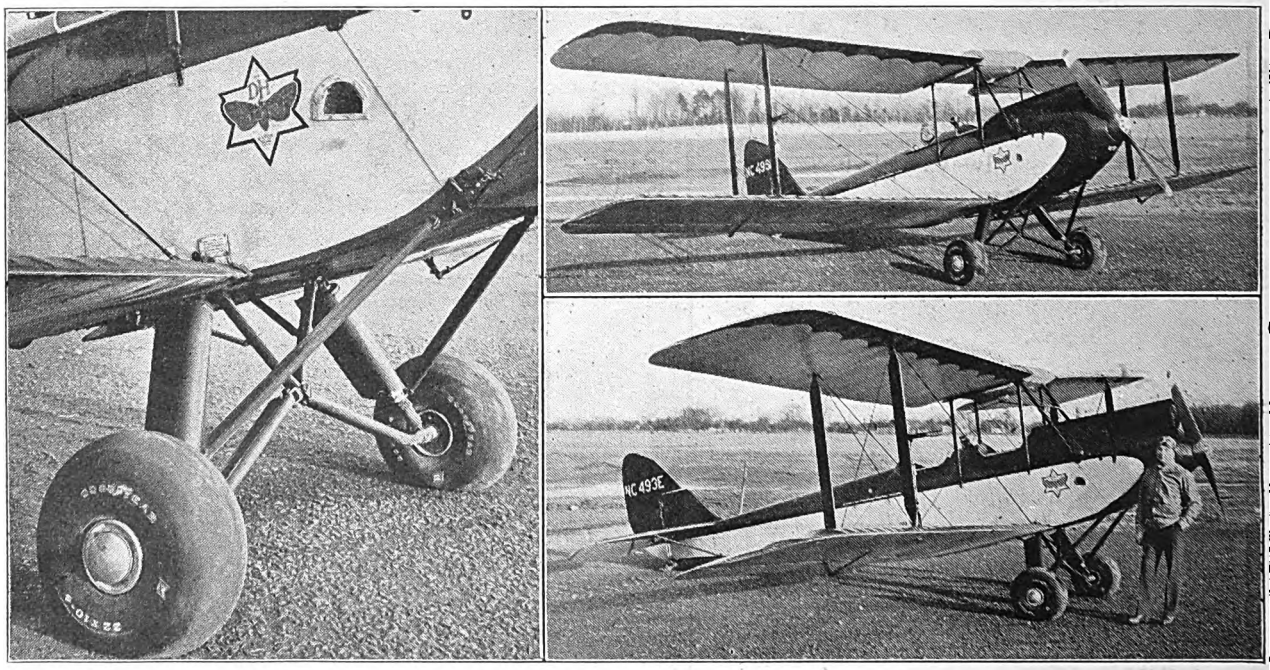
A TENDER FOR MOTHS.

A number of people who have lately learned to fly, who previously used big or medium-sized cars for transit, have now disposed of their big cars and have bought light aeroplanes and small cars.

A particularly suitable car for use as a tender to a Moth-Three is the M.G. Midget. This can be had either as an open 2-seater or as an "occasional 3" coupé.

The Midget is cheap to run and has a petrol consumption of about 40 m.p.g. If you are in a hurry to reach or to leave your aerodrome the Midget is capable of 65 m.p.h. Owing to the high rate of acceleration the average speed through traffic is good, and as an aeroplane tender is normally used for going short distances through traffic this point is very important.

Both Capt. de Havilland, the founder, managing director and chief designer of the De Havilland Aircraft Co., and Mr. Hubert Broad, the company's chief test pilot, are owners of M.G. Midgets.



THE GOODYEAR AIRWHEEL.—An English-built Gipsy-Moth owned by Mr. E. S. Bramley of the Redmond and Bramley Oil Co. Inc., of Rensselaer, N.Y. With the Goodyear Airwheel equipment Mr. Bramley flies his Moth into and out of fields where more experienced pilots have had their machines turned over by mud. He has also flown onto and off snow where everyone else has used skis.

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SPARS for MOTHS

CUT TO SIZE

OF FINEST SELECTED SITKA SPRUCE.

Guaranteed to conform to British Aircraft Specification.

A consignment of "POSEY" MOTH SPARS cut to size has recently been supplied to the De Havilland Aircraft Co., Ltd.

POSEY SPARS were used in Lindberg's Atlantic Flight.
POSEY SPARS „ „ „ Commander Byrd's North Pole Flight.
POSEY SPARS „ „ „ The World's Record Refuelling Flight, etc.
POSEY SPARS „ „ „ The First Flight from U.S.A. to Honolulu.
POSEY SPARS „ „ „ The Flight from New York to Tokyo.
By Messrs. Schlee & Brock.

European Representatives: **LOUIS BAMBERGER & SONS,**
27/28, FINSBURY SQUARE, E.C.2.

"MOTHS" PROTECTED BY HALL'S

AIRCRAFT PAINTS, VARNISHES & CELLULOSE LACQUERS.

All the world over in heat and cold, damp or dry the wood or metal structure of "Moths" is well protected by Hall's 2×14 Priming Varnish or 56A Black Enamel.

APPROVED MANUFACTURERS TO A.I.D. SPECIFICATIONS.

ESTABLISHED IN BUSINESS FOR ONE HUNDRED AND FORTY TWO YEARS.

JOHN HALL & SONS (BRISTOL and LONDON) LTD.,

MANUFACTURERS OF

BROADMEAD, BRISTOL. **173 PANCRAS RD., LONDON.**

Brolac

THE DOUBLE PROTECTION PAINT
with the Enamel Finish.

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VICKERS ACCESSORIES.

The reliability of the Moth is well known, and Vickers accessories, which are used for certain very important duties, contribute to the reliability of this machine.

Vickers streamline wires are used for the wing bracing, a Vickers hand-pump is used for transfer of fuel from one tank to another when an extra fuselage tank is used, and a Vickers petrol-cock is used to control the fuel supply from the standard centre-section tank to the engine

The hand-pump and fuel cock are of a special light type and have been developed by Vickers (Aviation) Ltd. of Weybridge for small aircraft.

CELLON DOPE.

The painting of aircraft has with the growth of private flying become a very important feature in the sale of light aeroplanes. Before the advent of the Moth the requirements of aircraft constructors were limited to very few standard pigmented dopes.

The production of light aircraft in quantity at a price analogous to that of a high-class automobile has introduced the feature of special colour schemes to the tastes of individual purchasers.

Cellon Ltd., with their Cellon Dope and Cerric Lacquers are in a position to produce special colour schemes with a finish that is vastly superior to that of paint and varnish.

National Flying Services have a colour scheme of black and orange and Cellon finishes have been standardised for the application of this scheme to all their aircraft. Other special aircraft colour schemes prepared by Cellon Ltd. are those of Shell-Mex Ltd., Anglo-American Oil Co. Ltd., etc.

Cellon Dope is made with cellulose acetate, which, with its resistance to fire, should appeal to the private owner.

TITANINE DOPE.

One of the most outstanding exhibits at the Aero Show at Olympia last year was the De Havilland stand, which included three Gipsy-Moths, and one of the most pronounced and universal comments on these machines was on the finish which had been got on fabric, wood and metal surfaces.

This was due in a large measure to the application of Titanine Dopes, Finishing Materials, Varnishes and Lacquers which have been used by the De Havilland Company for many years and are still used by them almost exclusively.

Titanine Dopes, as is well-known, give maximum tautness with minimum weight and maintain that tautness constantly under all climatic conditions. Titanine doping schemes also produce a very smooth and uniform finish which, in conjunction with constant tautness and extreme durability, is one of the greatest assets in the sale of aircraft.

JOHN HALL AND SONS.

John Hall and Sons (Bristol and London) Ltd., are well-known glass-merchants and craftsmen and manufacturers of paint, varnish and cellulose lacquer.

The company has been established for 142 years and their paint business has been built up chiefly on high quality finishes for the decorator and coach painter.

"Brolac" double-protection paint was originally produced for these trades, but it is suitable for every purpose. It is ideal for use on civil aircraft, where an attractive finish is required, as the finish is similar in appearance to that of colour and varnish or enamel and it resists extremes of heat and cold or sea water in a remarkable way.

The company first entered the Aircraft Industry during the War 1914-18 when they manufactured large quantities of varnishes for the protection of woodwork. They were re-approved as official manufacturers by the Air Ministry some six years ago and they are to-day in a position to supply everything in paint, varnish or dope.

Their head office and main works are at Broadmead, Bristol, the varnish and cellulose works at St. Philips, Bristol, and the new "Brolac" works and athletic ground at Hengrove, Bristol, adjoining the new municipal Air-Port.

Their London office and warehouse is at 173, Pancras Road, N.W., where is to be found the manager of their Aircraft Department, Mr. St. John Plevins.

WAKEFIELD CASTROL.

Since the first Gipsy engine was made in 1928 the De Havilland Aircraft Co. have always used and recommended Wakefield Castrol.

The grades recommended are: Castrol XXL in summer, Castrol XL in winter, Castrol CW in very cold climates, and Castrol R for racing.

The famous sealed engine test, in which a standard Gipsy engine ran faultlessly for nine months, and 51,000 miles was run throughout on Wakefield Castrol.

The consumption averaged .45 pints per hour, or nearly 1,500 miles per gallon, and at the conclusion of the test the performance of the engine was checked and proved to be in every way equal to that of a new one. On examination by A.I.D. Inspectors, it was found that the carbon deposit nowhere exceeded twelve thousandths of an inch in thickness—in all a remarkable confirmation of the faith of the De Havilland Company in Wakefield Castrol.

DUCKHAM'S ADCOL.

Alexander Duckham and Co. Ltd. have a very high reputation as manufacturers of lubricants.

This company is on the approved list of oil suppliers to the Air Ministry, which is entirely satisfied with their products and methods of manufacture.

Adco Aero Oil N.P.5 complies with the Air Ministry's Specification D.T.D. 109-P.4, and is recommended by the De Havilland Aircraft Co. Ltd. for the Gipsy engine and by Cirrus Aero Engines Ltd. for both the Cirrus and Hermes.

The same grade is used exclusively by the Brooklands School of Flying Ltd. for their fleet of Moths, and National Flying Services Ltd. use and recommend it.

In July 1929 Mr. A. C. M. Jackaman, in his privately-owned Gipsy-Moth coupé, won the Challenge Cup at the Rotterdam International Meeting on Adcol oil.

BALL-BEARINGS.

The standard ball-bearings used in the Gipsy engine are supplied by the Skefko Ball-Bearing Co. Ltd., of Luton.

The S.K.F. bearings which are used are a single-thrust ball-bearing, type 2910, 50 by 74 by 18 mm. in the main crankshaft, and two single-row deep-groove ball-bearings, type 6202, 15 by 35 by 11 mm., one in the magneto driving-gear, and one in the oil-pump driving-gear.

S.K.F. bearings are also used in the control system of the Moth, two on the central control unit and two on the aileron control.

An interesting fact is that the Managing Director of the Skefko in England, Mr. Karl Dahlbeck, was one of the first people from another country to learn to fly in England. He was at the Graham-White School in 1912 or 1913.

ENGINE CASTINGS.

Except for one or two items the whole of the aluminium alloy castings used in the Gipsy engine are, and have been since the engine was first produced, supplied by William Mills, Ltd. of Grove Street, Birmingham. These include such parts as crankcase, oil sump, timing gear cover, and a number of smaller castings.

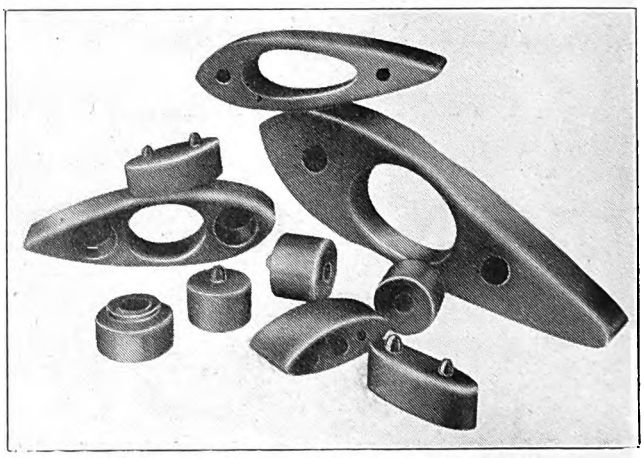
A considerable portion of the output of William Mills Ltd. is destined for use in aircraft engineering. This demands the very highest degree of foundry skill and metallurgical supervision and a special bay is set apart for this class of work. This bay has its own melting and alloying plant and is under the close personal care of the company's chief metallurgist.

THE AVON INDIA RUBBER CO. LTD.

The Avon India Rubber Co. Ltd. specialise in the manufacture of all rubber fittings for aircraft use.

This company has specially designed a large number of fittings for the De Havilland Aircraft Co. Ltd. for use on the Moth. These are made in various grades of rubber, the result of many years of specialised research and experiment, to meet A.I.D. specifications and tests.

Their specialised aircraft fittings include streamline, circular, solid and cylindrical section rubber shock-absorber compression buffers for undercarriages and oleo legs, rubber rebound buffers for undercarriages tail-skid shock absorber buffer-rings, tail-skid rebound buffer-rings, tank mounting rubber buffers, engine-mounting rubber buffers, oil and petrol-proof hose, etc. A selection of these are shown in the photograph below.



A selection of rubber accessories made by the Avon India Rubber Co. Ltd. for aircraft.

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ALUMINIUM CASTINGS

BY

WILLIAM Mills LTD

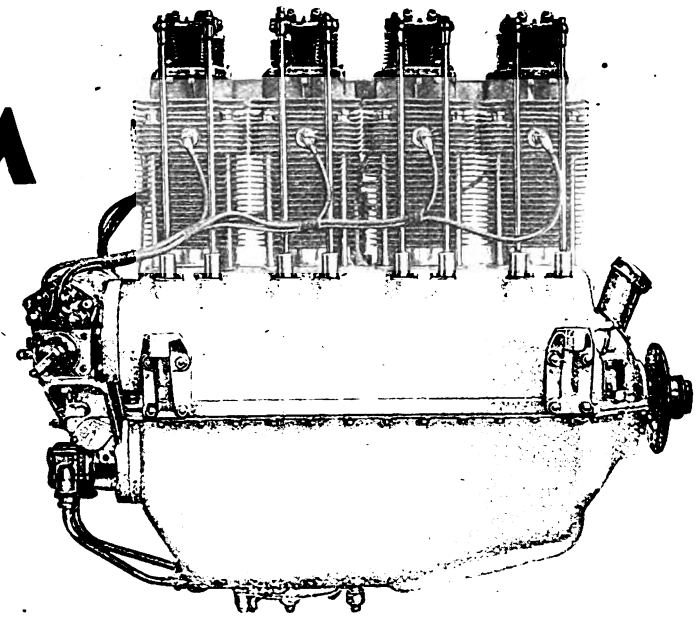

PHOTO OF GIPSY ENGINE BY COURTESY OF THE DE HAVILLAND AIRCRAFT CO., LTD.

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C&F.H. 131

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MOTHS IN THE SCHOOLS.

THE DE HAVILLAND SCHOOL OF FLYING.

The De Havilland School of Flying was the first school, outside the Clubs, to adopt the Moth as an instructional machine, and this school is now by far the biggest in this country. In addition to being a civilian school, it is also one of the officially appointed schools for the training of officers of the Royal Air Force Reserve. Elementary training is given on Moths and advanced instruction on D.H.9s.

The De Havilland Company also operates an Aeronautical Technical School, at which a thorough training is given to prepare aeronautical students for ground engineers' and pilots' licences.

The flying and ground schools have trained students from almost every part of the World. In 1928 the school flew a total of 4,445 hours and in 1929 the flying time was 6,791¾ hours, of which 3,806½ hours was R.A.F. Reserve training and 2,985¼ hours civil *ab initio* training. The equipment of the school in 1929 was 14 Moths and one D.H.9.

NATIONAL FLYING SERVICES.

National Flying Services Ltd. has organised a Sales, Service and Housing organisation for private owners.

In the sales of aircraft N.F.S. will either sell new machines, or will take second-hand machines in part exchange, or sell them on a normal commission basis. They have already sold over a dozen Moths, including seven new ones.

Attractive terms for housing light aircraft are offered by N.F.S. either in the general hangar, in the open or in private lock-up hangars. For aircraft of the Moth type with folding wings these charges range from £2 10s. per month, including landing fees, in the general hangar, to £3 15s. per month for a private lock-up hangar.

N.F.S. has also a maintenance service, which is available at all N.F.S. aerodromes for light aircraft housed on a period agreement, and for an inclusive monthly sum of £3 per week, or £12 per calendar month, complete maintenance of engine and aeroplane is made to a regular schedule.

National Flying Services also use Cirrus-Moths at their instructional centres in various parts of England.

Particulars of all these facilities for instruction and private flying offered by N.F.S. may be had on application to the head office at Grand Buildings, Trafalgar Square, London, W.C.2.

THE BROOKLANDS SCHOOL OF FLYING

The Brooklands School of Flying is situated in the centre of the Brooklands Race Track, the site of the oldest civil aerodrome in the country.

It is under the Managing Directorship of Mr. H. D. Davis, A.F.C., its founder and chief instructor, and the other instructors are Major C. M. Pickthorn, M.C., and Mr. E. H. Jones. All three have been graded A1 by the School of Special Flying at Gosport, and all have flown over 2,000 hours. There is particular interest also in noting that every shareholder in the company is a qualified pilot.

This school provides instruction of the very best type, has well-equipped living accommodation for pupils, a very complete repair and reconditioning service and a Moth sales service. The school operates on Moths, and it has a very enviable record for the quality of its output of trained pilots.

During 1929 the school flew a total of 3,332 hrs. 40 mins. on instruction and passenger flying with 13 Moths.

The sales service includes the sale of new and second-hand Moths, a part-exchange, and/or easy-payment system and an efficient service after sales.

AIRWORK LTD.

Airwork Ltd. have established themselves as the first unsubsidised Air-Park on modern lines. They have created a precedent and are regarded as a model. Interested people come from afar to see the Air-Park in being, especially people from enterprising municipalities who are thinking of shortly going and doing likewise for themselves.

The concrete hangar, the club house and social focus, the observation tower, the private lock-up hangars, and the showrooms have all been mentioned frequently in THE AEROPLANE. Heston is an approved Customs aerodrome, which is particularly handy for the private owner who wants to fly straight to the Continent and back.

The Airwork Flying School at Heston is, as far as the writer knows, the first organisation of its kind to use radio for instruction. A remarkably compact receiving set which weighs only three pounds is installed in the Airwork Moths. With it the instructor on the ground can tell the pupil what to do on his or her solo flight.

Airwork Ltd. have recently installed an engine overhaul and maintenance department. Here a private owner's engine can be taken down, washed, inspected and generally overhauled ready for its next 300 hours, or whatever the approved figure happens to be.

MARSHALLS' FLYING SCHOOL.

Marshalls' Flying School Ltd. opened their aerodrome on the Newmarket Road, near Cambridge, on June 9, 1929. This aerodrome is one mile from the centre of Cambridge and is served by a twenty-minutes omnibus service.

A Flying School was started in October 1929, coincident with the opening of the University year. This school operates with two Gipsy-Moths.

PHILLIPS AND POWIS AIRCRAFT LTD.

Phillips and Powis Aircraft (Reading) Ltd., of Reading Aerodrome, are Moth agents and also operate a Flying School, known as the Phillips and Powis School of Flying, in which they use five Moths.

Since the school started, at Easter, 1929, 1,035 hours have been flown, 216 pupils have taken instruction and 16 "A" licences have been obtained. Since the school has reduced its rates to £2 per hour, which, it is believed, are the lowest school rates in England, it has been very busy. Mr. W. Giddy is the Chief Instructor. As Moth agents the company keeps a new Gipsy-Moth in stock for immediate delivery and another for demonstration purposes. It offers every facility to private owners from a private aeroplane lock-up to a properly-equipped workshop. It has a stock of used Moths for sale ranging in price from £200.

Ten new and second-hand machines have already been sold, and the company has orders for three Moth-Threes.

THE AGRA ENGINEERING CO. LTD.

In May 1929 the Agra Engineering Co. Ltd., of Haldon Aerodrome, Teignmouth, S. Devon, became agents for the De Havilland Aircraft Co. Ltd. Since then they have taken five new wood-fuselage Gipsy-Moths, one new metal fuselage Gipsy-Moth, and they have on order one Moth-Three.

Up to the time they took the agency there had not been a Moth sold to a private owner in Devon or Cornwall.

The company carries a "running repair" stock of Gipsy engine spares for the benefit of private-owners or visitors.

For demonstration and tuition the company uses a wood-fuselage Gipsy-Moth, and its freedom from trouble has been highly gratifying.

IN THE SHOW ROOM.—The sales department of the Brooklands School of Flying Ltd., showing two machines ready for delivery.

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This proved Metal Propeller is now available . . . to the "Moth" owner . . . . . .

LIGHT
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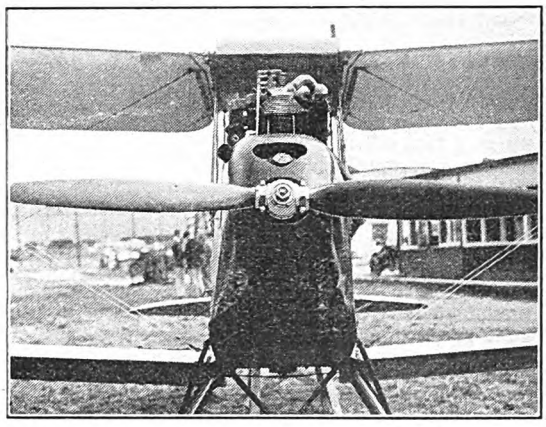
HERE is the ideal light aeroplane propeller. *Metal*—and so immune from warping, corrosion, or wear. *Of hollow laminated construction*—and so lighter yet more rigid than solid metal propellers. *Adjustable*—so that the owner can alter the pitch to suit his requirements. Years of experience are behind this propeller. Flying tests have proved its soundness. Fitted with it, your "Moth" will be a better aeroplane.

Price and Details on application.



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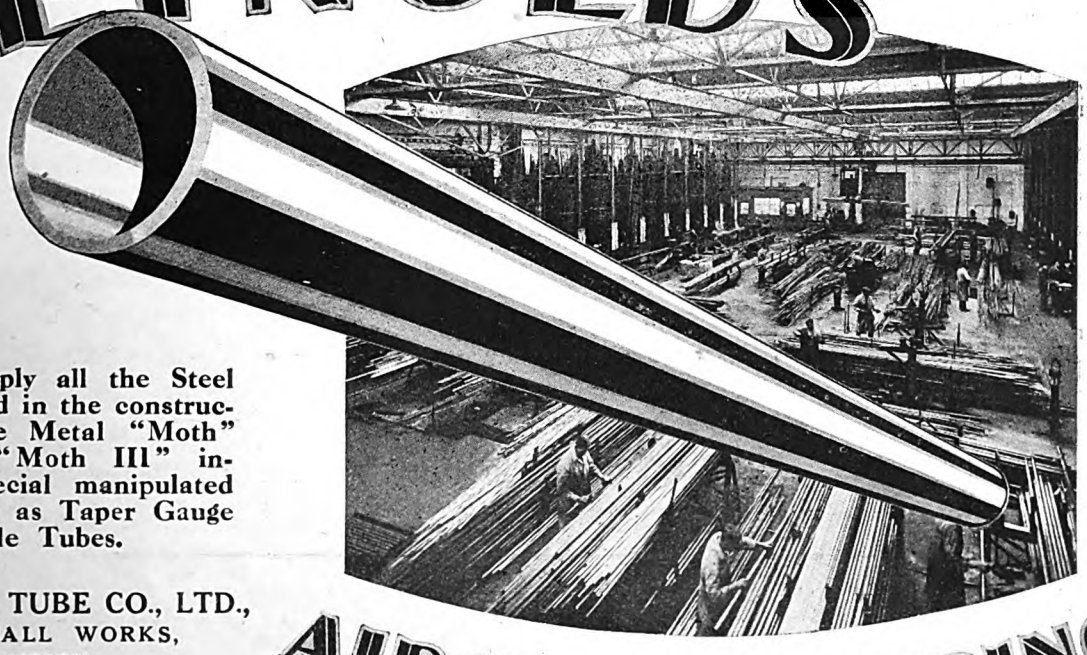

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MOTH USERS THE WORLD OVER.

AUSTRALIA.

In June 1925 the Australian Government bought the first two D.H. Moths from England. The object was to examine the possibility of this type as an economical training machine for the R.A.A.F. In November 1925 the Minister of Defence approved a Light Aeroplane Club scheme and an order for four Moths was placed in England.

The first club to begin operations was the Sydney Club, operated by the N.S.W. section of the Australian Aero Club.

From this time on the Moth was firmly established as an ideal training machine in Australia.

The direct result of the signal success of the Moth as a club training machine was the final adoption of the Moth by the Royal Australian Air Force.

Early in 1927 the Australian branch of the De Havilland Company was formed, under the title of The De Havilland Aircraft (Proprietary) Ltd., with head offices at Whiteman Street, South Melbourne. Major Hereward de Havilland was made Managing Director.

Major de Havilland landed at Perth in February 1927. A Moth which he had taken out with him was assembled, and in this machine, with Sq. Ldr. Eric Harrison, R.A.A.F., as passenger, he flew from Perth to Melbourne, a distance of 2,230 miles, in 32 flying hours.

The first Australian-assembled Moth was turned out in April and was supplied to the *Sun* newspaper of Sydney for press work.

Early in 1928 the De Havilland Aircraft (Proprietary) Ltd. received orders for twenty Moths to equip the training establishments of the Royal Australian Air Force.

During 1928 the six Australian Flying Clubs flew 8,007 hours, of which 5,076 hours were on dual instruction. In this period 124 club-trained pilots qualified for their "A" licences. The Sydney Club headed the list with 4,665 hours and 61 "A" licences, which enviable record was put up on eight Moths, six with Cirrus and two with Gipsy engines.

The Queensland and Northern Territory Aerial Services Ltd. (Qantas), and West Australian Airways Ltd., both big air transport concerns, operate flying schools with Moths, and these machines are frequently used for taxi flights when their regular air-line machines are otherwise engaged.

In the numerous meetings and competitions in Australia the Moth has taken its share of prizes and awards and at every meeting it has invariably outnumbered all other types.

In 1929 the Moth won the Australian Aerial Derby and was second in the Transcontinental Race from Sydney to Perth. In the latter race a special Gipsy-Moth, flown by Major de Havilland, made fastest time, averaging 107.8 m.p.h. for the 2,500 miles. Gipsy-Moths also came third, fourth, fifth and sixth.

Another outstanding Australian flight made during 1929 was one round the rim of Australia by Capt. the Hon. Hugh Grosvenor in a Cirrus-Moth.

In 1929 the Royal Australian Air Force invited tenders for the construction in Australia of 32 Gipsy-Moths. This order was awarded to the Larkin Aircraft Supply Co. Ltd.

The progress of the Moth in Australia is a repetition of that progress which has happened everywhere. Well over 100 Moths have been sold by the Australian company.

CANADA.

During 1927 the Department of National Defence bought its first D.H. Moth (Cirrus engine). This machine was a seaplane and was used by an expedition sent to the Hudson Straits in that year to choose bases for the ultimate establishment of a regular Hudson Strait air patrol.

In 1927 the Ontario Provincial Air Service introduced the Cirrus-Moth to commercial aviation and this service has the distinction of being the first to use the Moth seaplane.

The Ontario Provincial Air Service has since enlarged its fleet of Moths and the Gipsy-Moth is giving magnificent service.

During 1928 the Government bought twenty-five Cirrus-Moths, ten for the then recently-established Flying Clubs, which began operations in the Spring, and fifteen for the R.C.A.F. stations engaged on civil air operations.

By the end of 1928 the number of Canadian Flying Clubs had grown from eight to fifteen and all these Clubs had been equipped with Moths.

On Dec. 31, 1928, the total Club membership was 2,403 and the total flying time for the year was 8,124.5 hours, although no Club had been in operation before May. One hundred and eleven Private Pilots' and twenty-eight Commercial Pilots' Licences had been granted to Club-trained personnel.

In 1929 all these figures were eclipsed. The number of Clubs had grown to twenty-four. Twenty of them put up a total of 15,052.77 hours' flying for the year. Two hundred and twenty Private Pilots' and fifty-seven Commercial Pilots' Licences were granted.

On Mar. 1, 1928, the De Havilland Company opened its Canadian branch in Toronto. This company, known as the De Havilland Aircraft of Canada Ltd., was placed under the management of Mr. R. A. Loader, who was previously the Assistant Business Manager of the parent company.

By August 1929 the company was in a new factory at Downsview, near Toronto, alongside a large aerodrome. The factory is fully equipped and is built for rapid expansion when necessary. The Moth is now assembled from components sent out from England, but the factory is rapidly approaching the state when it will build almost everything.

The Gipsy-Moth now forms a large part of the equipment of the R.C.A.F. and the Flying Clubs.

The 1930 Canadian model embodies many improvements suggested by experience under local conditions. As the result of suggestions by the R.C.A.F. such modifications as dual tail-adjustment gear, improved crash-padding, altitude control, and parallel-motion rudders-bars have been embodied.

Other problems directly concerning Canadian requirements which the company have tackled have been the production of a suitable ski-undercarriage and the provision of an efficient cockpit-heating apparatus.

During 1928 the company delivered 62 Moths to all parts of Canada.

During 1929 it delivered over 130 Moths, mostly of the metal-fuselage type with the Gipsy engine. A considerable portion of these aircraft were seaplanes, and about 95 per cent. were fitted with the Handley Page automatic slot.

The firm estimated that by the end of 1929 over 250 Moths had been supplied to Canada.

IN AUSTRALIA.—A Gipsy-Moth belonging to Lady Somers, the wife of the Governor of Victoria, being fuelled at Essendon aerodrome, Melbourne

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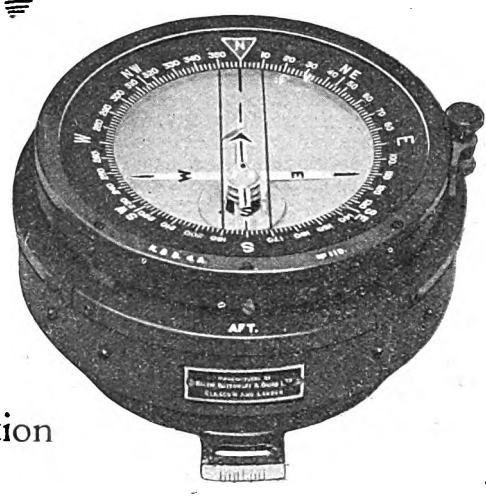
KBB Compasses *for*



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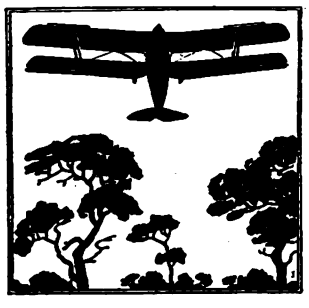
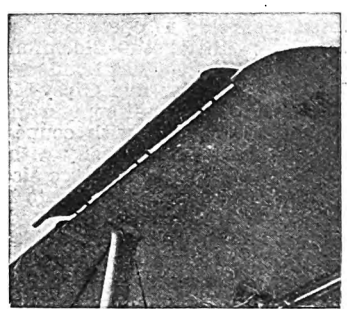


AUTOMATIC SLOTS



"For the year ended 30th September, 1929, the Company delivered approximately 130 'Moth' aircraft, and about 95 per cent. of them were fitted with Handley Page slot gear."

Extract from the 1929 report of the De Havilland Aircraft of Canada, Ltd., in "Canadian Aviation," February, 1930.

HANDLEY PAGE, LTD.,
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INDIA.

India has been very slow in taking to Civil Aviation. Its genesis was the fine flight of Messrs. Stack and Leete from England to India in two Cirrus-Moths in 1926.

This and the excellence of the machines aroused great interest in India, but no action was taken until Sir Victor Sassoon, Bart., a member of the Legislative Assembly, and one of the pioneers of British Aviation at Brooklands in 1910 and 1911, induced the Government and the Assembly to sanction the formation of the Aero Club of India and Burma.

In the following year four Flying Clubs were started,—at Delhi, Bombay, Calcutta and Karachi. Two Gipsy-Moths and a spare engine were ordered for each Club.

In the year 1929 these four Clubs flew a total of 4,021 hours, of which 2,725 hours were instructional flying. They have a total membership of 917, and in the year 72 members (48 Europeans and 24 Indians) took "A" licences.

By December Bombay had acquired two and Bengal one extra machine, thus making a total of 11 Gipsy-Moths for all the Clubs. The Government of India has now sanctioned the formation of two new Clubs, at Lahore and Madras, and these are also to have Gipsy-Moths.

Each of the existing Clubs has already provided a few private owners.

With the despatch of the original eight Moths from England, the De Havilland Aircraft Co. Ltd. sent Wing Cdr. D. S. K. Crosbie (late R.A.F.) to India as their representative to superintend the erection of the machines and to report on the best trading policy for the future. A depot for spares and service was opened at Karachi in October 1929 by Wing Cdr. Crosbie, and arrangements for service stations in Bombay and Calcutta have been made.

SOUTH AFRICA.

Early in 1929 Aeros (Proprietary) Ltd., of Johannesburg, were appointed to represent the De Havilland Aircraft Co. Ltd. in the Union of South Africa, Northern and Southern Rhodesia, and, under special conditions, Portuguese East Africa. This company is managed by Major G. Haggie (chairman), Capt. R. Douglas and Capt. S. S. Halse, and it will keep an adequate stock of D.H. products.

Previous to this the Moth has been very prominent in South Africa. Many Moths have flown from England to Cape Town and many distinguished flights have been made.

In 1927 Major H. H. Miller, D.S.O., made a propaganda tour of the Union and impressed multitudes with the efficiency of his machine. The Flying Club movement has penetrated to South Africa and several Clubs have Moths.

In 1929 a company known as Union Airways Ltd. was granted a subsidy to operate air mail services on the Cape Town—Port Elizabeth—Bloemfontein—Johannesburg and the Port Elizabeth—East London—Durban routes.

For these services five Gipsy-Moths were acquired, three single-seaters with mail compartments in place of the front seat, and two-seaters with coupé tops. The single-seaters have since been fitted locally with coupé heads.

The South African Air Force also has several Gipsy-Moths for training purposes at Roberts Heights.

The first Moth to be imported into Rhodesia was one belonging to the Rhodesian Aviation Syndicate. This machine was used for air photography and instruction.

Another Rhodesian owner is Sq. Ldr. C. S. Wynne-Eyton, who has used his machine extensively for all kinds of purposes, under all weather conditions. In addition to solo flying he has carried over 1,200 passengers, and during the whole of this time his repair bill amounted to £2.

One of the most outstanding flights in a Gipsy Moth was that made by Mr. J. L. King, who flew from Johannesburg, to carry a supply of anti-hydrophobia serum to a woman missionary in Northern Angola, in Portuguese West Africa. The total distance covered in the out-and-return trips was 6,000 miles, and a large proportion of the journey was over virgin forest and swamp.

WEST AFRICA.

The first Moth to arrive in West Africa was one flown out to Accra, Gold Coast, from England, by Capt. R. S. Rattray, M.B.E., B.Sc., who is a Provincial Commissioner.

Capt. Rattray learned to fly at Stag Lane while on leave in England, and he left on Dec. 5, 1928, in a Moth he had bought, to return to duty less than six months after he had begun to learn to fly. He reached Accra on Jan. 15, 1929, after making a pioneer solo flight of 5,000 miles.

The second Moth to arrive in that part of the World was one owned by Mr. Boyd-Carpenter, of Kano, Nigeria.

Both these two pilots use their machines very largely as their normal transport and have continually demonstrated the extreme reliability and usefulness of the Moth.

Mr. Boyd-Carpenter, after making over 2,000 landings, many of them on very rough ground, has reported that he has had no trouble with his machine. The only damage sustained has been five punctures from thorns!

KENYA COLONY.

The first Moth to be imported into Kenya was one brought by Commander L. Mansfield Robinson, the Managing Director of the British East Africa Broadcasting Co. and Vice-President of the Aero Club of East Africa.

The second Moth to arrive was owned by the late Lady Carbery. On Feb. 16, 1928, she made a pioneer flight from Mombasa to Nairobi, a distance of 325 miles, in 3½ hours.

Since then Moths have been prominent in Kenya. Apart from the Moths which have passed through Nairobi to and from England or Cape Town, the Aero Club of East Africa has been presented with a Gipsy-Moth by Lord Wakefield.

Wilson Airways Ltd. has also acquired a Gipsy-Moth. This machine was flown out from England by Flt. Lt. F. A. Swoffer between Sept. 21 and Oct. 21, 1929, a distance of 6,000 miles in 78 flying hours.

This same machine, flown by Mr. Campbell Black, has been used this year by H.R.H. the Prince of Wales.

Other prominent owners of Moths are Lord Carbery and Sir Piers Mostyn, who have flown all over Kenya.

NEW ZEALAND.

The first D.H. Moth (Cirrus engine) to be imported into New Zealand arrived in Auckland in February, 1928. This machine, G-NZAT, was taken back from England by Mr. F. D. Mill, the Managing Director of the Air Transport and Survey Co., who, during a stay of four or five months in England, learned to fly, acquired his "A" and "B" licences and his Ground Engineer's Certificate.

Besides acting as the distributing agent for the Moth in New Zealand, Mr. Mill's company is engaged in an air survey and photography.

In April, 1928, the New Zealand Government's decision to buy eight Moths was announced. Four were to be used as training machines by the New Zealand Air Force and the other four to be loaned to two newly-formed Light Aeroplane Clubs at Christchurch and Auckland.

In April, 1929, an Air Pageant was held at Auckland and at this meeting nine Moths, with either Cirrus or Gipsy engines, competed, three from the Auckland Club, one each from Hawkes Bay, Marlborough, and Canterbury Clubs, one belonging to the N.Z. Air Force, and two commercial Moths, one belonging to the Aerial Transport and Survey Co. Ltd. and one to Hamilton Airways. In the serious events, which included an Aerial Derby (two heats and final) and a landing competition, Gipsy-Moths took first and second places in every heat and every final.

By the end of 1929 there were twenty-four civil aircraft registered in New Zealand and of these nineteen were Moths. This does not include those owned by the Government.

NEW GUINEA.

In July 1927 the Morobe Trading Co. of Rabaul, British New Guinea, bought a D.H. Cirrus-Moth to start a transport service from its base at Lae to the Edie Creek station.

In January 1928 another Cirrus-Moth was despatched to New Guinea to open up a service between Wau and Lae, to be operated by Messrs Pentland and Royal.

These first two Moths have been followed by several others. The companies which have used Moths for transport are Guinea Airways Ltd., Taylor and Ross Air Transport, and Papuan Airways Ltd.

SARAWAK.

In 1928 the Sarawak Government bought two Gipsy Moth seaplanes for patrol and other duties. At the outset the Government thought that the Moth would only be able to alight on large stretches of water and therefore considered that its uses would be limited.

The country abounds in disused and flooded mines and on one of the first flights an alighting was made on one of these. It was then found that practically all these pieces of water were suitable for the Gipsy-Moth. The Government was duly impressed with the unexpected handiness of the machine.

SINGAPORE.

The first Flying Club to be formed in the East was the Singapore Flying Club. This Club has used Gipsy-Moth seaplanes with great success and their machines are doing excellent work with great reliability.

THE IRISH FREE STATE.

In June 1926 the Irish Free State Army Air Corps purchased four D.H. Moths (Cirrus engines) for the elementary training of pupil officers and cadets at Baldonnel, near Dublin. Since then a large number of pupils have been through the flying school and the instructors are all unanimous in their praise of the Moth.

Throughout this period, with the exception of one crash in which the machine was "written off," but with only slight injuries to the pilot, not one single replacement has had to be made to the machines.

The engines (Mark I type) have been almost as uniformly free from trouble and have run, on an average, over 260 hours between overhauls.

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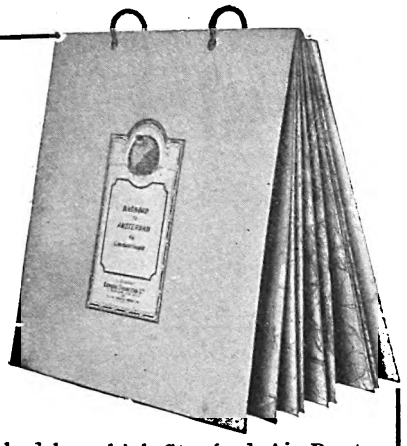

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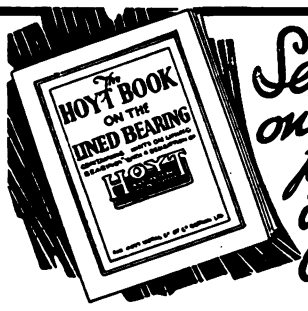

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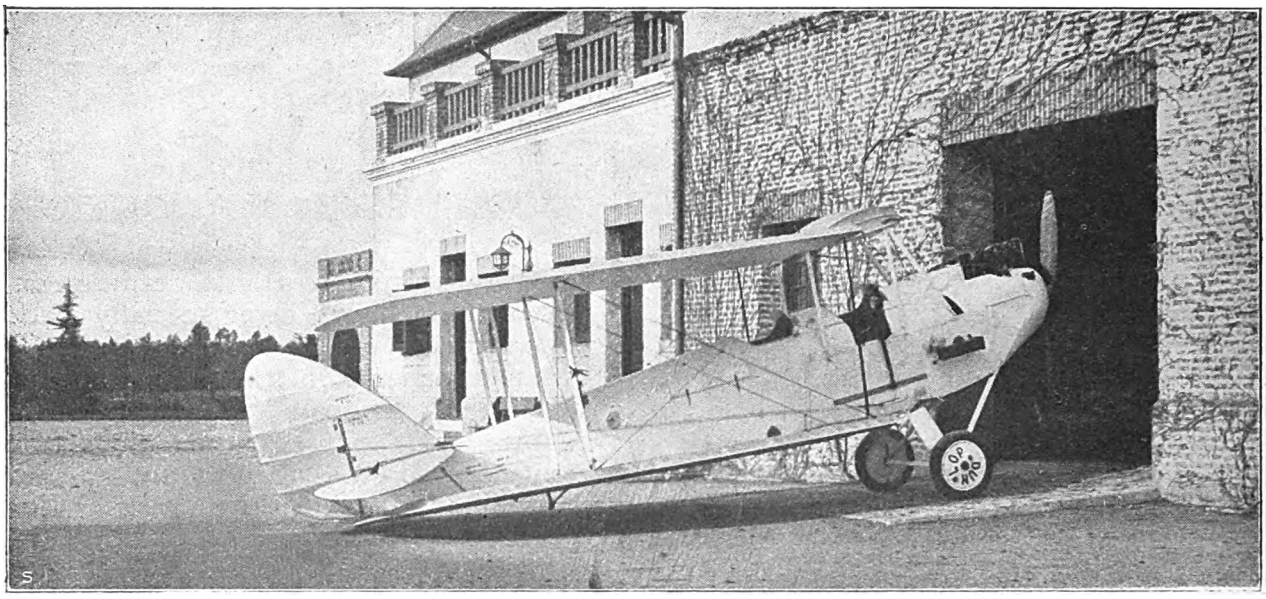


IN THE ARGENTINE.—A Cirrus-Moth which is garaged at an Argentine hacienda.

THE ARGENTINE REPUBLIC.

In the last three years Major Shirley Kingsley, the Moth agent for Argentina, has imported 18 Moths into the country,—which is more than all other commercial aircraft imported over the same period put together.

Major Kingsley also operates an air survey and photography company, and this company uses two Moths. From these two machines over 15,000 photographs have been taken with a total flying time of about 1,000 hours.

Among the regular users of Moths in that part of the world are the Shell-Mex Organisation, the Bieckert Brewery Co., and the Centre of Aviation of Uruguay, which is the Uruguayan Aero Club. Apart from many private individuals, there are three Government-subsidised local Aero Clubs, which are using Moths.

BRAZIL.

For the survey of Rio de Janeiro by the Aircraft Operating Co. Ltd. a Gipsy-Moth seaplane was chosen. This very important contract called for a survey of the city covering 142 sq. mls. and 783 sq. mls. of the surrounding Federal district.

Two Moths have also been bought by Capt. Sydney Holland for photography, survey, charter-flying, joy-riding and exhibition work.

CHILE.

One of the first countries to realise the value of the Moth as a training machine was Chile. The Chilean Army Air Service now has a large quantity of Gipsy-Moth landplanes for preliminary training. At the present moment there are sixty-four Gipsy-Moths in the country,—sixty landplanes and four seaplanes.

CHINA.

In December 1928 an order for four Moths was received by the De Havilland Company for China. This was the first order for British aircraft for China since 1921.

During 1929 orders for thirty-one more Gipsy-Moths came from China. All these were ordered for flying-schools in various parts of China.

COLOMBIA.

In 1929 the Sociedad Colombo-Allemana de Transportes Aereos (Scadta), which company has been operating a network of very successful air routes in Colombia since 1919, acquired two Gipsy-Moths to supplement its regular fleet of big all-metal German aircraft.

One of these machines made an experimental flight with a load of mail from Buenaventura to Bogota across the Andes. As the result of this successful crossing the Scadta Company has decided to establish feeder-lines on their main mail routes, and the Gipsy-Moth will be used.

Also, early in 1929 the first privately-owned Moth was sold to Dr. P. von Bauer, of Barranquilla.

All these machines were sold by Herr Friedrich, of Berlin, the German agent for the Gipsy-Moth.

DENMARK.

The D.H. Moth was introduced into Denmark in 1927, when four Moths took part in the 1st International Flying Meeting at Copenhagen on Sept. 4.

One Moth, flown by Mr. Hubert Broad, won second place in the Speed Handicap Race, earned a special award in the Height Competition and tied first with a famous French pilot in the Aerobatic Contest. As the result of this success the machine flown by Mr. Broad was bought by the Danish magazine *Ude og Hjemme* (Out and Home), and has since been flown all over Denmark for propagandist purposes.

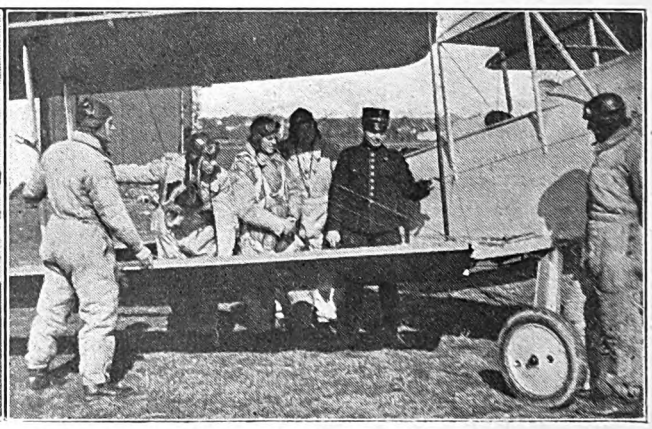
Since then the Moth has become universally popular in Denmark. It is used by the Royal Danish Navy, the Royal Danish Army Air Service, the sole Danish air traffic company, Det Danske Luftfartselskab A.S., and by many private owners.

FINLAND.

The first Moth to arrive in Finland was one sent out by the De Havilland Company at the request of the Air Defence League in November 1927. This machine arrived in Helsingfors early in November and was demonstrated by Mr. Hubert Broad before the competent authorities.

The machine was eventually bought by the Air Defence League. For the rest of the year this machine was flown all over Finland and Lapland, where it gave joy-rides and aerobatic exhibitions. It had a total flying time of 400 hours and carried over 1,200 passengers.

Finland, wrongly called the "land of a thousand lakes," as there are at least 83,000, is ideal for the Moth seaplane.



IN DENMARK.—Pupils of the Royal Danish Naval and Army Air Services with Gipsy-Moths which are the standard training machines of these Services.

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IN FINLAND.—A Cirrus-Moth equipped with skis for winter flying in Finland.

Seven of the thirty-four associations or clubs of the Air Defence League have their own machines, with which they carry on an intensive propaganda in their districts. The machines are all of the light type, mostly Moths, piloted by Air Force officers or N.C.O.s. borrowed from the Air Force.

In 1928 the licence for the construction of the Moth was acquired by the State Factory through the military authorities, and early in 1929 the first Cirrus-Moths were handed over to the Air Defence League. Three machines were got by different branches of the League, and the section at Pori, in N.W. Finland, acquired for itself a coupé Gipsy-Moth.

The Finnish Air Force have seen the value of the Moth, and a number of these machines have been built for training.

Mr. C. S. Emery, who is the energetic agent for the Moth and the Cirrus engine in the Baltic countries, was responsible for the steady progress of the Moth in Finland.

FRANCE.

In October 1929 the De Havilland Aircraft Co. Ltd. received a notification from the French Government to the effect that the British Certificate of Airworthiness for the Moth would be accepted by the French Air Ministry, the first concession of this type to be arranged between England and France.

Later in 1929 Aéroplanes Morane-Saulnier, the well-known French aircraft constructors, acquired the licence to manufacture the D.H. Moth in France.

Besides building the Gipsy-Moth, the Morane-Saulnier company have made arrangements for a number of service stations throughout France and North Africa.

On Jan. 1, 1930, there were three privately-owned Gipsy-Moths in France. During January seven Moths were delivered, and in February a further eight were delivered.

The first agency to be appointed by the Morane-Saulnier company, held by MM. Avignon and Cousin, of Montpelier, for Central France, has placed an initial order for nine Gipsy-Moths for delivery after May.

GERMANY.

The German agency for the Moth is held by Herr A. Friedrich, who maintains a Gipsy-Moth service station at the Tempelhof Aerodrome.

Herr Friedrich has sold several Moths to private owners in Germany as well as to the famous Colombo-German company known as the Scatda.

Herr Udet, the famous war-time pilot, last year bought a Genet-Moth to compete with Herr Fieseler in an aerobatic competition at Berlin. This machine was one of the first Genet-Moths to be supplied to the R.A.F. for aerobatics and was one of, if not the, first machines to do the outside loop.

GREECE.

In April 1929 Mr. Hubert Broad flew a demonstration Moth from England to Greece at the instigation of Mr. Coutroubis, the De Havilland Company's Greek agent. The result of the demonstration at Athens was the immediate sale of the machine to the Greek Naval Air Service.

Later in the year the Greek Naval Air Service decided to adopt the Gipsy-Moth as a standard training machine, and a number were ordered from the De Havilland Company.

ITALY.

The Moth and the Gipsy and Cirrus engines are very well known in Italy. Practically all the long-distance flights to the East and to Africa have passed through Italy.

The first Moth sold in Italy was delivered by air in November, 1927, to the Italian Government. Since then several others, both landplanes and seaplanes, have been sold to the Italian Government. General Balbo had two at his disposal and in these he has flown all over Italy.

There are also several Italian private owners and at least one Flying Club, the first to be formed in Italy, at Genoa, has been using Moth seaplanes with success.

MEXICO.

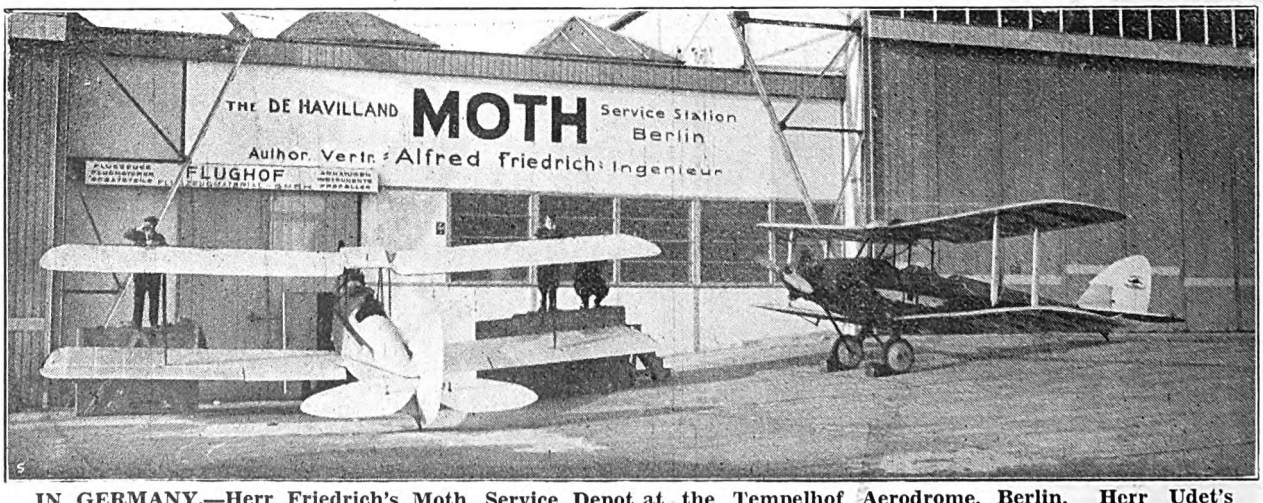
Early in 1929 a Gipsy-Moth was imported into Mexico by Mr. H. Geoffrey Fletcher, a contractor to the Mexican Government and the agent for the Moth in Mexico City.

The Moth was unloaded at Vera Cruz and was assembled on the beach, whence it was flown to Mexico City, which is 7,200 feet above sea level and 215 miles away.

Owing to the direction of the wind the machine had to take off across the beach at Vera Cruz, which was barely 60 feet wide, and over the sea, which is full of sharks.

The Moth made a perfect take-off, and, piloted by Capt. Christiane, of the Mexican Air Force, with Mr. Fletcher as passenger, reached Mexico City in 2 hrs. 15 mins., after having climbed 16,500 feet to clear the mountains.

A few days after the Moth reached Mexico City the



IN GERMANY.—Herr Friedrich's Moth Service Depot at the Tempelhof Aerodrome, Berlin. Herr Udet's aerobatic Moth, formerly the property of Sq. Ldr. Soden, R.A.F., may be seen on the right.

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Escobar revolution broke out and the Moth was taken over by the Mexican Government. Capt. Lopez Marlo, of the Mexican Air Force, flew it to the scene of the operations in the north of Mexico, where it was used for observation work.

At an Air Race Meeting held in Mexico City this same Moth, piloted by Coronel Castillo Breton, won the first race held, and a Moth, piloted by Dr. Cossio, was second.

A third Moth has since been imported into Mexico. It is owned by Señor Castellan, a wealthy oil operator.

These three Moths have all given excellent service and have all been flown virtually all over the Mexican Republic.

NORWAY.

The first Moths were introduced into Norway in 1929 by Halle and Peterson, of Oslo, which company, in addition to being the D.H. agents in Norway, was entrusted with the operation of a night mail service between Oslo, Gothenburg and Malmo, a distance of 425 miles.

Two Gipsy-Moths were acquired and the first ten trips, over difficult country in bad weather, were completed to schedule. This is the first air mail service in Norway.

Shortly afterwards a Gipsy-Moth seaplane was bought for service in the North of Norway, for herring- and seal-spotting, and it has given excellent service in all weathers.

More recently the Norwegian Ministry of Defence has bought three Gipsy-Moths for training purposes and has also acquired the licence to build it at the Government Factory.

POLAND.

The Moth has been introduced into Poland by Mr. B. de Skorzewski, who has been appointed the local agent.

Mr. de Skorzewski took delivery of a Gipsy-Moth at Stag Lane in November, 1928, and flew it back to Warsaw by way of Spain, North Africa, Sicily, Italy and Austria, and the flight was made with no trouble whatever. There are now four Gipsy-Moths in Poland, two of which belong to the Polish Air Force.

PORTUGAL.

The first D.H. Moth to be sent to Portugal was acquired by Mr. Carlos Bleck in January, 1928. This was the first aircraft to carry Portuguese civil marking (C-PAAA) and Mr. Bleck was the first holder of a Portuguese civil pilot's licence. He flew from Stag Lane to Lisbon, a distance of 1,240 miles, in 16 hours' flying time.

In January, 1929, the first Portuguese Flying Club was formed in Mozambique, Portuguese East Africa, and this Club bought a Gipsy-Moth.

In September, 1929, the Portuguese Naval Air Service, after examining various types of aircraft likely to be suitable as a primary training machine, decided to choose the Gipsy-Moth, and an order for four seaplanes was placed.

SPAIN.

The first Moths to be bought by Spain were two for the Royal Spanish Aero Club and one for the personal use of the Duque de Estremera, the President of the Aero Club. These were flown from Stag Lane to Madrid by three Spanish pilots at the end of 1927.

The success of these first Moths as economical training machines has led to further Spanish orders and at least one commercial firm has acquired a Moth.

Early in 1929 a formation of five Moths led by the Duque de Estremera flew from Stag Lane to Madrid. Four of these Moths were acquired by the Compana Espanola de Trabajos Fotogrametricos, an aerial survey company. These were modified so as to accommodate a special aerial camera as well as a photographer in the back cockpit. The fifth machine was the latest acquisition of the Duque de Estremera, who in addition to being the Managing Director of the C.E.T.F.A. is also the official De Havilland agent.

In November, 1929, two Gipsy-Moths were flown from Stag Lane to Madrid by two Spanish Army Officers and these were delivered to the Spanish Army Air Service.

SWEDEN.

Late in 1927 Aero Material A/B. decided to open a Flying School at Stockholm, and three D.H. Moths were ordered. By the end of January 1928 the machines had arrived and on Jan. 29 they took part in the Royal Swedish Aero Club Display held on Lake Brumisuiken, near Stockholm, before a crowd of 40,000 people. On the following day several of the leading pilots of the Swedish Air Force tested the Moths, and after their flights they all expressed their satisfaction

On Feb. 1 the Flying School was opened in the presence of the Chief of the Air Force, General Amundsen, and members of the Government. Immediately after a brilliant aerobatic display school training began with an initial membership of 23 pupils. By Mar. 17, 21 of the 23 original pupils had qualified for the Private Pilot's licence.

During the 1928 season four Moths flew a total of 935 hrs. 17 mins. on school, joy-ride, photographic survey and general propaganda flying. The total number of pupils for 1928 was 46, of whom 33 qualified for the Private Pilot's licence.

During 1929 three Moths flew 596 hrs. 37 mins. and sixteen pupils qualified for their Private Pilot's licence.

The total distance flown during 1928 and 1929 amounts to approximately 114,000 miles.

In July, 1928, a Moth seaplane was sold by Aero Material A/B. to the Royal Swedish Air Force, and this machine formed part of the equipment of a Swedish Expedition sent to Spitzbergen to look for the crew of the ill-fated Italian airship *Italia*. This machine, flown by Lieut. Schyberg, rescued Capt. Lundborg from the Nobile camp.

U.S.A.

In June 1928 a company known as the Moth Aircraft Corporation was formed in America to manufacture the Moth under licence. And the licence for the Gipsy engine was acquired by the Wright Aeronautical Corporation.

The Moth Aircraft Corporation is now a division of the Curtiss-Wright Group, the most powerful aircraft manufacturing organisation in the United States.

In the first three months active operations of the Moth Aircraft Corpn. the company had reached an average output of four Moths a week. During this period the company delivered 17 machines and received orders for 134.

In addition to a large number of private owners, there are several schools which are operating with Moths.

One expressive American view says that the Moth has "the stability of a large ship, the manœuvrability of a pursuit ship and lands like a housefly on a bald head." There can be little better to be said for any aeroplane.

Early in 1930 the Moth factory was moved from Lowell, Mass., where it was established, to St. Louis, Mis., and early in March, the 150th American Moth was completed. This machine was the first production Moth to be fitted with the American-built Wright Gipsy engine.

At the National Air Races, held at Cleveland last summer with two streamlined racing Moths and one standard coupé model, the Moth Corporation won five cups and something like $7,000 and Moths finished first in the three events.

YUGO-SLAVIA.

On April 27, 1929, the first Moth for Yugo-Slavia was baptised at Stag Lane. This machine, which was acquired by Mr. T. W. Mapplebeck, the De Havilland agent in Belgrade, was the first British aircraft sold to Yugo-Slavia.

It was flown from London to Belgrade by Mr. J. G. D. Armour, with Mr. Mapplebeck as passenger. Afterwards it was demonstrated all over Yugo-Slavia, and both the Army and Navy Air Services have been much impressed.

There are now six Moths in the country, four of which have been bought by the Yugo-Slav Naval Air Service. One is owned by the Zaghreb Flying Club, and one belongs to the Army Air Service.

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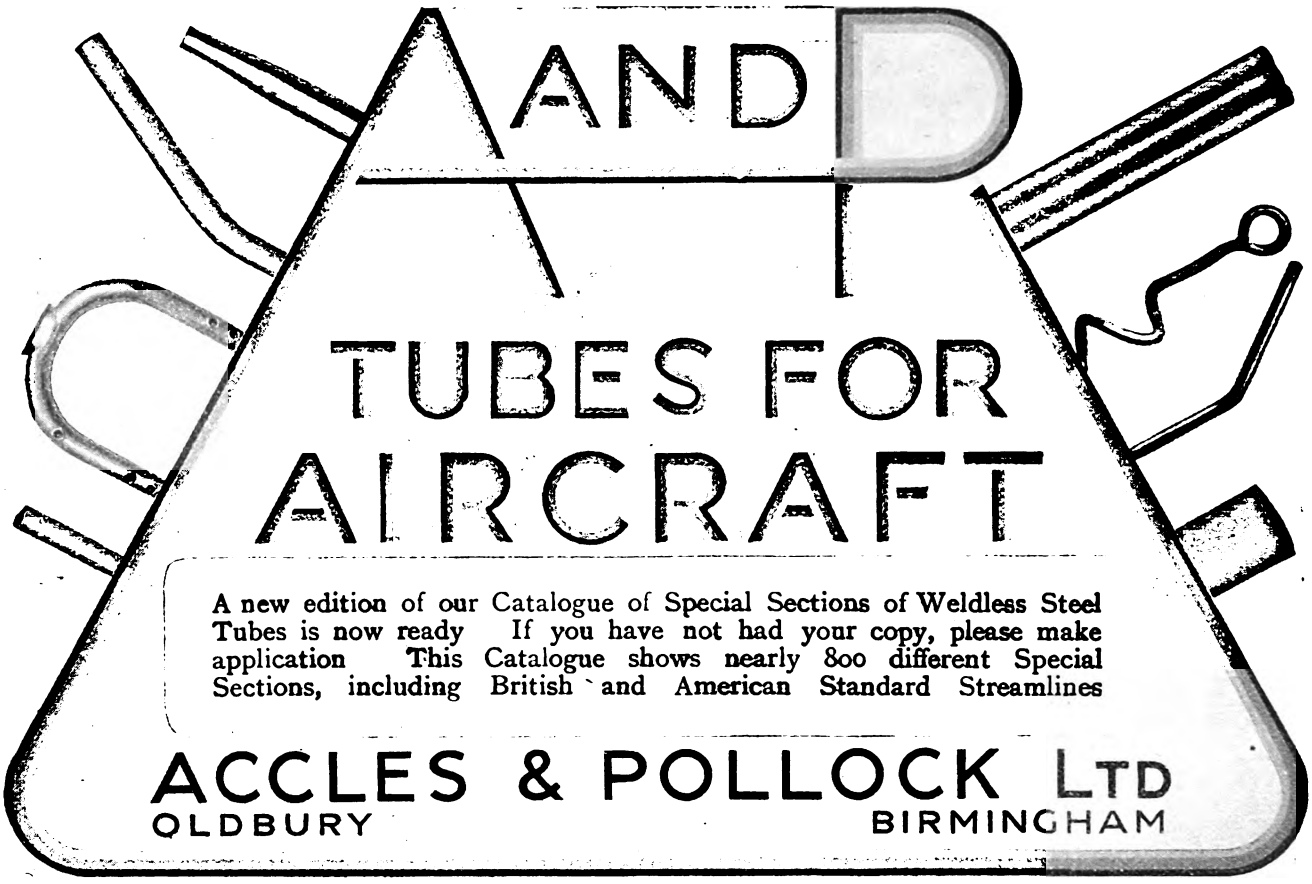

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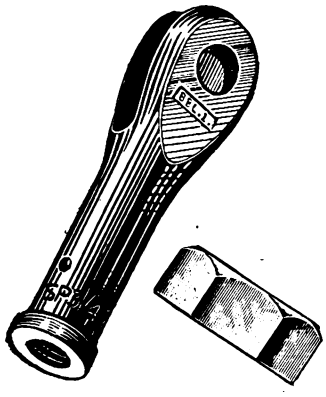

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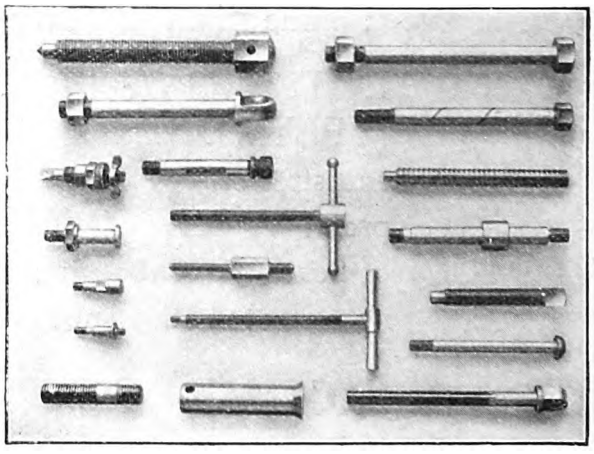

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SUPERMARINE

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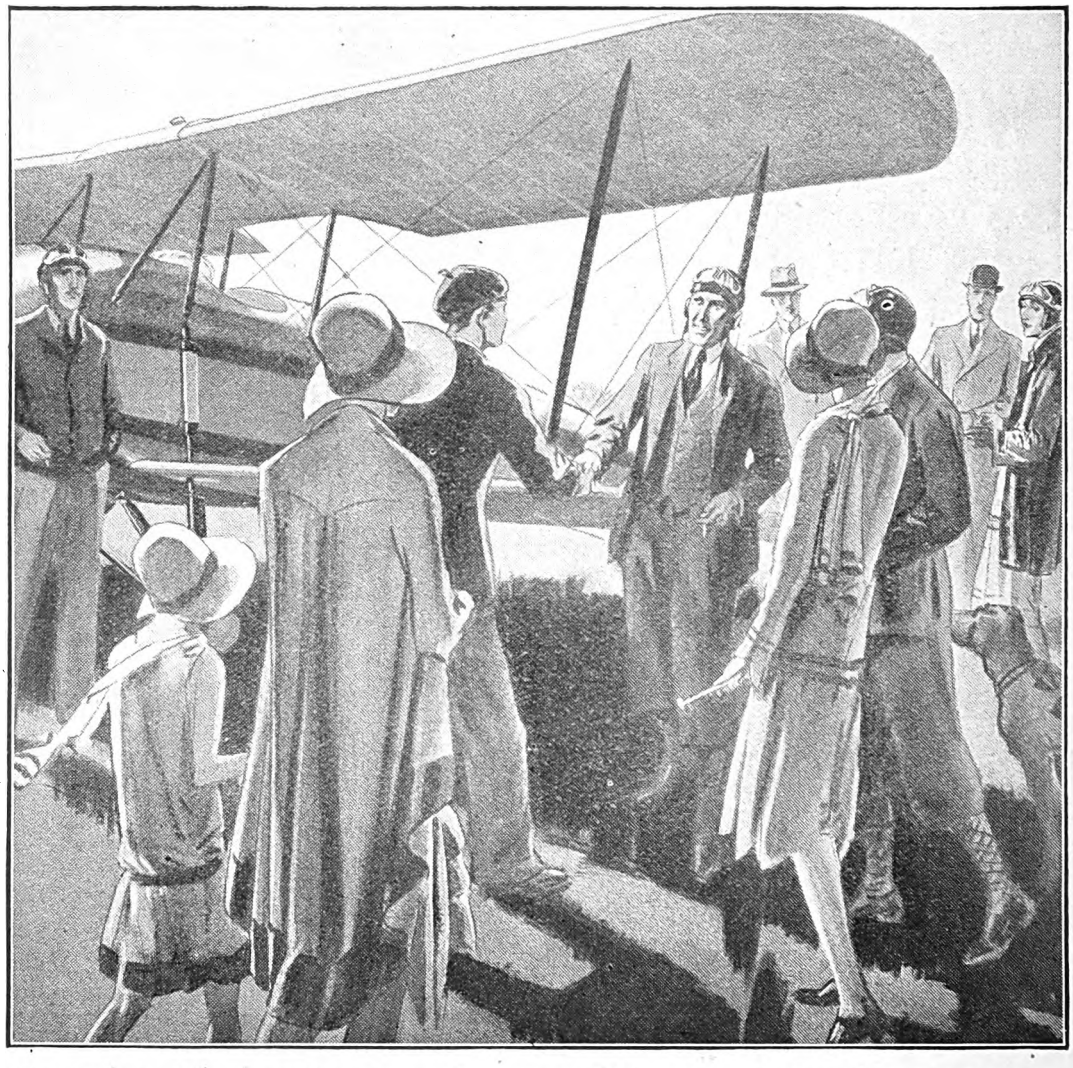
ALL THE DIFFERENCE IN THE WORLD



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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

THE GRAND TOUR (MODERN STYLE).

On April 17, the Thursday before Easter, a large convoy of light aeroplanes will leave Heston Air-Park for a Grand Tour of Europe. One understands that, up to the time of writing, twenty people and fifteen machines will start. The Tour will last eleven days and will go by way of Brussels, Cologne, Frankfurt-a-M., Munich, Salzburg, Vienna, Prague, Dresden, Berlin, Amsterdam, and so back to Heston.

There was a time when a young man of good family could not consider his education complete until he had made the Grand Tour. This was a tour of the European capitals, and because the coach was the only means of transport, such a tour might last for two years. This was a long time ago, and the custom has become extinct. The speed of the aeroplane has, however, made possible the compressing of a similar tour within an Easter holiday.

Airwork Ltd. has organised the Tour, and the two directors of the company, Messrs. H. N. St. V. Norman and F. A. I. Muntz., are to be congratulated on the brilliant scheme they have evolved, the like of which has never been seen before. The Tour will achieve three objects at once.

First, such a large convoy of British civil machines, all of standard types and owned either by a private company or by individuals, cannot fail to impress Continental nations. The additional fact that a number of the pilots are novices will drive home the advantages of British standard types as machines for the private owner. The Tour seems likely to achieve much in the way of propaganda and in a way that could not be got by any means other than an organised demonstration-tour made by a combination of Trade interests.

Secondly, the Tour will demonstrate the ease, practicability, and safety of Continental touring by air, either with the crowd or by one's self. The third object of the Tour, like that of its prototype, is educational, for the members of the Heston Tour will be enabled to study the latest developments of Civil Aviation in the various countries through which the Tour will pass.

Captain V. H. Baker, M.C., D.F.C., will be the pilot in charge. His decision in matters relating to general safety will be final. The convoy will fly in pairs, so that an experienced pilot can keep his eye on each novice,—or, perhaps one should say, so that the novice can play follow-my-leader.

The pilot of each machine will be provided with telegraph forms similar to the field post-cards which were used in the War 1914-18. These forms will be arranged so that, in the event of a forced landing, information can be telegraphed in the language of the country to the next flying-base for help and spares.

Two aircraft in the convoy will act as tenders and will carry a stock of spare parts. Also, a ground engineer will accompany the convoy. He will inspect each machine every morning before the pilots take-off. He will also supervise minor adjustments and ordinary running repairs. The possibilities of such a convoy, so completely equipped, seem enormous, and the time when large coveys of light aircraft go flying round the World seems close. People will spend their Summer holidays in some such fashion.

On the first day after crossing the Channel some of the convoy are likely to survey the old battlefields of Flanders from the air. A whole day is to be spent in Berlin to give the tourists a chance of inspecting the Tempelhof Airport in the middle of the city. Tempelhof, like Heston, has been laid out from an architectural standpoint, and much attention has been given to the comfort of the onlookers.

On the way back the convoy will fly over the Netherlands province of Rhijn, and that will make stay-at-homes envious. At this time of the year acres and acres of tulips stretch from Haarlem to Hillegom and are one of the seven wonders of the modern world, even when seen from the railway train.

Mr. Gordon Selfridge, Jnr., Mr. and Mrs. Chalmers, Mr. Downes Shaw, Mr. Roddy Denman, Mr. Jack Shand, Mr. Harold Peake, Mr. W. D. Macpherson, Mr. John Turner, and Mr. Robert Perkins have all made arrangements to go, as have, very naturally, Mr. Norman and Mr. Muntz.

A MOTH AMPHIBIAN FOR MR. GUINNESS.

Mr. Loel Guinness, who, with his wife, formerly the Hon. Jane Barbara Yarde-Buller, has for some time been flying a Gipsy-Moth landplane, has now ordered one of the new Moth Amphibians. The amphibian landing gear was specially developed for the Moth by the firm of Short Bros., of Rochester.

A DESOUTTER AIDE.

A Desoutter monoplane (Cirrus-Hermes engine) was chartered to fly photographs of the Grand National from Aintree to London so that *The Morning Post* might have the pictures for its early editions. The journey from Aintree to Hendon was done in two hours ten minutes.

A LUCKY ESCAPE.

Miss Gladys Grace, of the Hampshire Club, a granddaughter of the famous "W. G.", had a very lucky escape on Mar. 27, when she spun into the mud of the Hamble River. Apparently Miss Grace stalled the machine on top of a loop. Miss Grace was found conscious in the machine, although the engine and fuselage were deep in the mud. She was detained in the South Hampshire Hospital.

EXPERT CHOICE.

M. Dieudonné Costes, famed for his many long-distance flights on French Military aircraft, has just acquired a De Havilland Moth, now built under licence in France by the pioneer firm of Morane-Saulnier, famous for the Morane Parasol monoplane which did great service during the War 1914-18. M. Costes recently beat the World's Long-Distance Record by flying non-stop from Paris to Tsitihar, in China, a distance of nearly 5,000 miles.

A FOILED START.

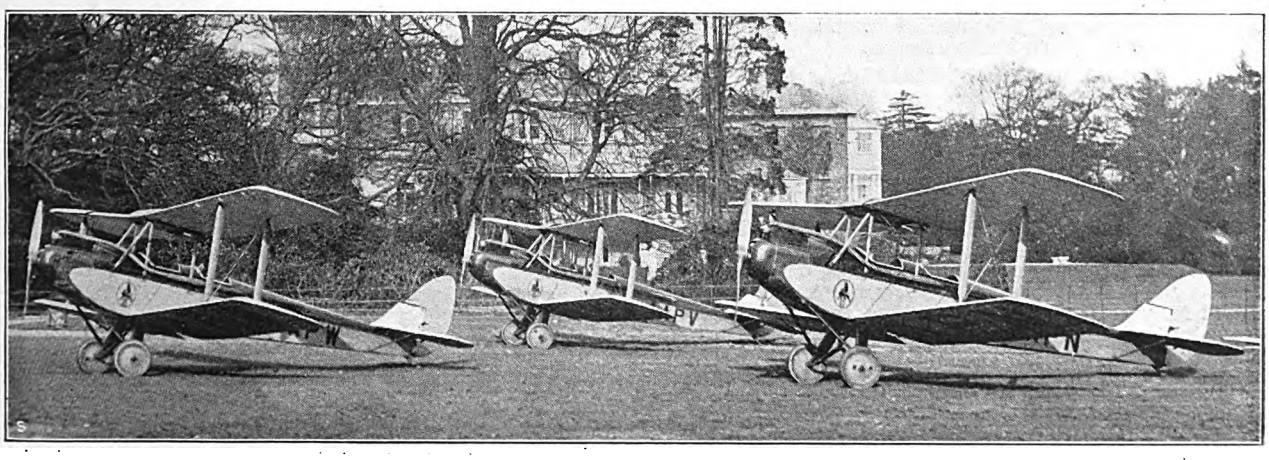
On Mar. 23 Mr. C. H. Parkerson left Lympne in the early morning for Lyon (France). He announced just before starting that he would attempt to beat Mr. Bert Hinkler's record for a solo flight to Australia. A few hours later he crashed at Lizy-sur-Ourcq in bad weather.

THE BENGAL FLYING CLUB.

The Bengal Flying Club was formed in August, 1928, and it began operations in February, 1929. From the date of opening to the end of 1929 the Club flew a total of 1,126¼ hours of which 733½ hours were on dual instruction.

The Club trained 27 pilots of whom 20 were *ab initio* and 7 were qualified pilots. Of the *ab initio* pilots, three were Indians.

The membership is now approximately 400, of which one-third are Indians. The Instructor is Mr. W. F. Warner.



CIRRUS-MOTHS.—A group of three Cirrus-Moths belonging to National Flying Services Ltd. standing in front of the Club-house at Hanworth.—(*"Aeroplane" photograph.*)

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A NEW ENTERPRISE.

Some months ago there was published in THE AEROPLANE the usual official notification of the registration of the Robinson Aircraft Co., Ltd.,—formed to manufacture light aeroplanes. The firm is now established in Offices in Stafford Road, Wallington, Surrey, and in manufacturing premises at the Waddon Aircraft Factory, in Croydon Aerodrome.

The machine they are manufacturing is known as the Redwing and will be flying shortly. It is a side-by-side two-seater biplane with folding wings and it has many novel features. One is told that the selling price will be considerably below that of any light aeroplane of similar engine-power and carrying-capacity.

In drawing up the specification a high performance was not aimed at, as this necessitates a higher-powered engine with consequent higher initial cost and higher running costs. A medium-powered engine with low initial cost and low running costs will be fitted, hence the low selling price. The cruising speed will be 85 m.p.h. and, with the wing section used, a landing speed of 30 m.p.h. is confidently expected. The Company have been granted a licence by Handley Page Ltd. to fit their automatic slots.

No further details are permissible at the moment because the firm do not wish anything much to be said about it until it has finished its Martlesham tests. Herein they are wise, for many a potentially good business has been spoiled by shouting too much about what it is going to do.

The first aircraft of this type—G-AAUO—will be flying some time in April and it has already been entered for the International Light Aeroplane Tour of Europe, which starts from Berlin on July 20 next.

BRISBANE—MELBOURNE.

On Feb. 13, Messrs. Jules Moxon and C. W. Scott left Eagle Farm, Brisbane, at 04.30 hrs., in a Gipsy-Moth and flew to Melbourne, a distance of over 1,000 miles, where they arrived at 18.40 hrs. the same day.

The Moth was piloted as far as Sydney by Mr. Moxon and Mr. Scott flew another machine which had to be delivered at Sydney before midday. They reached Sydney at 10.30 hrs. and left again at 11.30 hrs., this time both in the same machine with Mr. Scott as pilot. Over the Blue Mountains in thick cloud they "flew blind" for two hours.

They reached Cootamundra at 14.40 hrs., and a stop was made for five minutes to refill petrol tanks. Another five minutes were spent at Bowser, near Wangaratta, thence they headed straight for Melbourne with throttle wide open. Their flying time for the 1,000 miles was 13 hrs. 20 mins., and the total cost of the journey, including meals for both at Sydney, was £6 14s. Shell petrol and oil were used.

THE AUSTRALIA—ENGLAND ATTEMPT.

On Mar. 24 Mr. David Smith, who is said to be about 20, left Sydney, Australia, in an attempt to fly to England. His machine is a Ryan monoplane, and he is accompanied by Lieut. W. H. Shiers. In 1919 Serjt. W. H. Shiers formed one of the crew of four who flew to Australia in the Vickers Vimy (Rolls-Royce Eagle engines) with Capt. Ross Smith.

On Mar. 28 the Ryan reached Newcastle Waters, Northern Australia, and on Mar. 29 was forced to land 40 miles from Wyndham, which is at the foot of Cambridge Gulf, on the north coast of the Kimberley Division of Western Australia.

On Mar. 31 the men and the machine were found by a search party on the ground.

The finding of this machine and its crew is a valuable object-lesson. It carried a transmitting radio set but no receiver. The crew were able to broadcast their plight and to report that they had broken a cam-shaft. They also said they were short of food, but had plenty of water. The same radio set told of the arrival of the rescue-party.

The difference between this incident and the forced landing of the *Southern Cross* was that the *Southern Cross* had a wind-driven generator which was useless on the ground, whereas the Ryan had a source of electric power which could be used under such circumstances.

A REGAL PURCHASE.

According to *Reuter* the Vicomtesse de Sibour has sold her D.H. Gipsy Moth the *Safari* to the King of Abyssinia. The Vicomtesse is the daughter of Mr. Gordon Selfridge and was flying to Kenya with her husband. The *Safari* was the machine in which the Vicomte and Vicomtesse made a tour of the World.

THE ARMOUR WIND DIRECTION INDICATOR.

The Armour Wind Direction Indicator, which has already been described in THE AEROPLANE, has proved very popular, and is now being developed. A Mark II cylinder has been designed for use in Service low-bombing practice as a cheap and efficient substitute for the present "bombs."

Two other cylinders are being developed, one for finding direction of wind over water, and the other, which produces coloured smoke, for use over snow-covered country.

The complete equipment of the standard Mark I type is now being marketed by Smith's Aircraft Instruments at £4 15s.—M. S.

GLIDING.

THE INAUGURAL MEETING OF THE B.G.A.

On Mar. 27 the inaugural meeting of the British Gliding Association was held at 18, John Street, Adelphi. The President, Sir Sefton Brancker, was in the chair. As a result of the ballot seven of the original ten members of the provisional Council were re-elected, of the remainder one member retired and the others were not elected. Five new members were elected, making a total of twelve.

A curious thing was the non-election of Mr. Marcus Manton, who has probably had more flying experience than the rest of the Council put together.

The Council of the B.G.A. is now as follows: Mr. J. R. Ashwell-Cooke, Mr. D. E. Culver, Flt. Lt. C. Crawford, R.A.F., Mr. R. F. Dagnall, Mr. E. C. Gordon England, A.F.R.Ae.S., F.I.M.T., Mr. Alan Goodfellow, Mr. T. E. Lander, M.C., Mr. C. H. Lowe-Wylde, A.R.Ae.S.I., Mr. C. H. L. Needham, M.Sc., F.R.Ae.S., Dr. Purves, F.R.S.E., Mr. S. W. Whidborne, M.C., and Mr. A. L. Wingfield, M.C., D.F.C., A.R.Ae.S.I.

[Thus "The Squadron of Death," as the B.G.A. has been facetiously called by a reader of Mr. Dick Grace's entertaining book, is launched to a good start. One hopes that it may soar indefinitely.—C. G. G.]

Sir Sefton Brancker opened the meeting with a lecture outlining the history of gliding up to the present, and illustrated with slides.

Mr. Howard Flanders, the Honorary Secretary, read his report and had the balance-sheet shown on the screen. This is quite healthy considering the short time the Association has been in existence; it showed how the Association is indebted to Sir Charles Wakefield.

The writer failed to see any reference to the glider presented to the B.G.A. by Mr. Dagnall, presumably an asset. This glider is on loan to the London Club, who may, of course, turn it into a liability.

Mr. Gordon England addressed the meeting on the need for progressing slowly, and for organising a display of soaring by an experienced German pilot.

Sir Sefton Brancker stated that the Air Ministry were prepared to let the B.G.A. make and supervise its own airworthiness regulations. He also said that a school for gliding would shortly be started under the auspices of the Association.

Colonel The Master of Sempill moved a vote of thanks to the President, Sir Sefton Brancker, which was seconded by Mr. Handley Page. Mr. Handley Page laid stress upon the responsibility the B.G.A. would have to shoulder in looking after the airworthiness regulations and he pointed out the set-back the movement would receive from any fatalities.

Nobody at the meeting made any reference to meteorology. Yet without meteorology soaring flights in Germany would never have become a fact. The energetic backing of the meteorologists and the researches made for this science are responsible for the astounding feats achieved on the Continent.

There is an immense amount to be learnt about rising and falling air-currents before soaring becomes possible. If the Clubs have to find out everything by bitter experience and without scientific help and advice much time will elapse before anything noteworthy is achieved. Let us hope that the meteorologist will see in gliding a means of furthering his knowledge of air-currents and in the Gliding Club a means of healthy amusement.

THE USES OF GLIDING.

The following letter deserves the attention of intelligent readers:—

Sir,—I was very surprised to read the uncalled-for attack on gliding in this month's number of a contemporary aeronautical publication, and regret very much that anyone should see fit to disparage the present wave of enthusiasm for gliding at a time when it could not be more harmful to the movement.

No extravagant claims are being made on behalf of the glider but it should have, without any doubt, a definite place in the sphere of aeronautics. The following give, in brief form, the uses and advantages of this side of aviation:—

1. Owing to the cheap initial cost, together with very low upkeep and maintenance, gliding places the sport of flying within the means of practically everybody. This should result in creating more air-mindedness than any other form of flying activity.

2. In soaring flight, of any duration, success is due solely to the capabilities of the pilot. There are no powerful engines to rely on for getting out of scrapes and the pilot quickly learns to rely solely on himself.

3. The fascination of noiseless gliding and soaring flight has an appeal of its own that powered flight cannot have. Unless an aeroplane is used for getting from place to place, normal flying tends to become boring because there is so little for the pilot to do when once in the air, whereas in soaring flight the interest and enjoyment of continually manœuvring for better positions, not always accompanied with success, are sufficient to retain the utmost keenness and enthusiasm.

4. Lastly gliding may well mean the real beginning of general flying on a large scale. It must be remembered that gliding is mainly "ground flying," and this is the most valuable and difficult part of flying. It is not too much to claim that a pilot who has completely mastered the art of gliding, and has advanced through light machines to big machines, must be better than one who has not started at the bottom. Consider for instance a pilot who has flown only a few hours on light machines when suddenly his engine cuts out. A forced landing would mean little to one skilled in glider flight.

Gliding should be the foundation of flight.

It is not claimed that gliding can ever be of use in the strictly commercial sense any more than sailing ships could compete with steamships to-day. But as the foundation of flying training and as an exhilarating sport it is not likely to be easily displaced.

Comparison of gliders in relation to aeroplanes with the bicycle and

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"Flight" Photo.

MARCH 23 1930

+ PORT DARWIN + AUSTRALIA +

AIRCRAFT WONDERFUL

UNDER ALL CONDITIONS

Copy of a cable received from Flying Officers Piper & Kay.

+ PIPER

Yet another proof . . . . . of DESOUTTER supremacy

THE successful flight from England to Australia of Flying Officers Piper and Kay, who left in February and arrived on March 22nd, provides yet another proof of Desoutter supremacy. For a flight of a few miles or round the world, the Desoutter is equally "wonderful."

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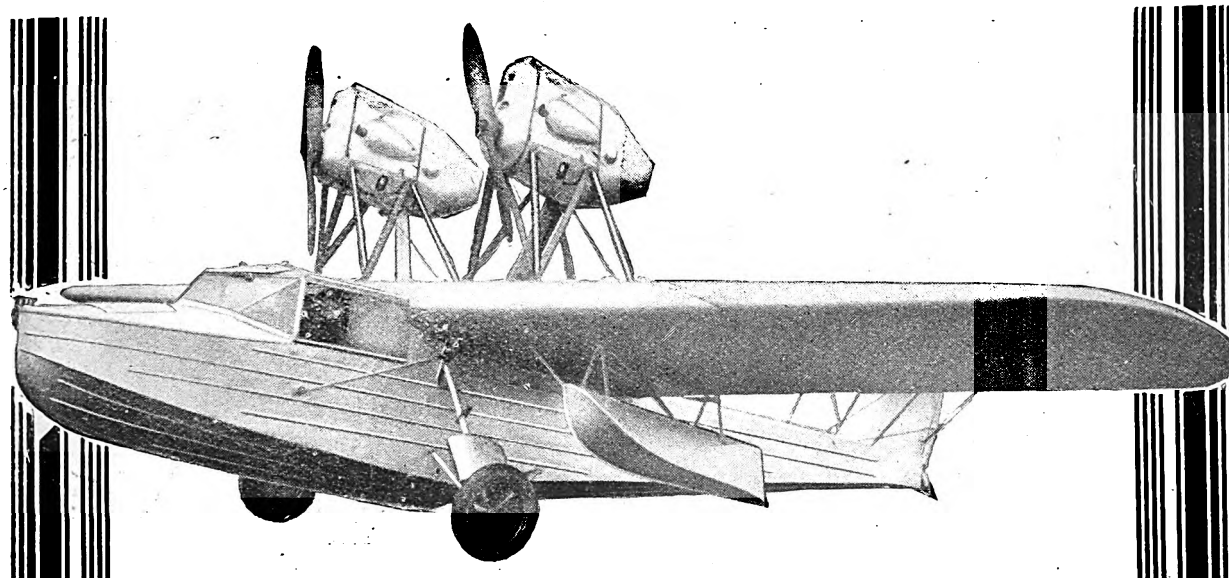

THE SARO "CUTTY SARK"

THE "Cutty Sark" is the first private owner's flying boat. Large enough to be seaworthy, yet small enough to be handy, she brings all the well-known advantages of the flying boat within the reach of the private owner.

Powered with two light aero engines, she cruises at 90 m p.h. and seats four in a silent and vibrationless cabin. Her absence of wire-bracing indicates that maintenance has been reduced to a minimum. Provision has been made for easy handling on the slipway and when taxying.

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Write to Saunders-Roe for this "Cutty-Sark" catalogue.

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COMMERCIAL AERONAUTICS.

WESTERN CANADA AIRWAYS.

On March 3 the Mayor of Winnepeg lighted a beacon on the roof of the store of the Hudson's Bay Company in Winnepeg to celebrate the inauguration of the Winnepeg-Calgary night air mail service of Western Canada Airways.

This beacon tower comprises a 2,000,000 candlepower direction light pointing towards Stevenson Field and a neon beacon. The beacon was designed and installed by Western Claude Neon Lights Ltd. of Winnepeg and is the first of its kind in Canada and the largest and most powerful in the British Empire.

Western Canada Airways has been awarded a contract by the Post Office Department for the operation of the Winnepeg—Regina—Moose Jaw—Medicine Hat—Calgary route of 771 miles with a branch route from Regina going north-west to Saskatoon, North Battleford and Edmonton, a distance of 501 miles.

The Winnepeg-Calgary route has been equipped for night-flying and beacons have been placed at ten mile intervals all along the route and revolving beacons with a visibility of 90 miles have been installed at Winnepeg, Brandon, Regina, Moose Jaw, Medicine Hat, Calgary and at seven other locations on the route. Emergency landing grounds have been laid out throughout the length of the route. The company is using nine aircraft, six Fokker F.XIV monoplanes and three Boeing 40, B-4 biplanes, all with Pratt and Whitney Hornet engines.

The pilots on the service are Major D. R. MacLaren, D.S.O., M.C., Major G. A. Thompson, Mr. H. Hollick-Kenyon, Mr. M. E. Ashton, Mr. W. J. Buchanan, D.F.C., Mr. C. M. G. Farrell, D.F.C., Mr. F. Roy Brown, Mr. A. H. Farrington, Mr. A. E. Jarvis and Mr. W. N. Cumming, D.F.C. They have been allotted to the following services:—Winnepeg-Regina: W. J. Buchanan and G. A. Thompson. Regina-Calgary: F. R. Brown, A. H. Farrington, A. E. Jarvis and H. Hollick-Kenyon. Regina-Edmonton: M. E. Ashton, W. N. Cumming, C. M. G. Farrell and D. R. MacLaren.

The Winnepeg-Calgary route will be flown over nightly in each direction and aircraft will make twenty-minute stops at Regina, Moose Jaw and Medicine Hat. Westward, the aircraft leaves Winnepeg at 21.00 hrs. and arrives at Calgary at 05.00 hrs. Eastward the aeroplane leaves Calgary at 02.15 hrs. and arrives at Winnepeg at 12.00 noon.

For the Regina-Edmonton route the aeroplane leaves Regina at 08.00 hrs. and arrives at Edmonton at 13.30 hrs. In the reverse direction the aeroplane leaves Edmonton at 12.15 hrs. and arrives at Regina at 18.00 hrs.

Western Canada Airways Ltd. began operations on Christmas Day 1926 with one Fokker Universal monoplane, and in three years has expanded to an organisation using 36 aircraft.

Its first service was between Hudson and the Red Lake Mining area and this proved so successful that five further machines were bought. In March 1927 the company entered into a contract with the Federal Department of Railways for the transport of 8 tons of material and equipment and 14 men from Cache Lake on the Hudson Bay Railway to Churchill, the new port on Hudson Bay.

By the end of April 1927 the three machines had flown 34,395 miles, carried 319 passengers and 81,392 tons of express matter over entirely undeveloped territory.

During the summer of 1927 mail was carried officially for the first time by the company. On June 1 an air base was established at Lac du Bonnet for the convenience of prospectors and companies operating in South-East Manitoba mining district and an air mail contract was entered into for this area. During the summer a further two machines were acquired.

During the 1927 summer season the company's small fleet flew 111,439 miles in 1,447 hours and carried 1,428 passengers and 339,338 lbs. of express freight.

In the winter of 1927-8 a third base was established at The Pas and the fleet augmented by two Moths and five more Fokker Universals. The total operations during the winter was 121,207 miles in 2,005 hours. 2,183 passengers, 185,333 lbs. of baggage and freight and 11,862 lbs. of mail were carried.

In the summer of 1928, ten new machines including 6 Avio Avians, three Fokker Universals and one D.H.61 were acquired, and in May a new base was established at Vancouver, B.C. For this station one HS-2L, two Canadian Vickers Vedettes and three Boeing flying-boats were added.

During the summer of 1928, 423,986 miles were flown in 5,281 hours by the company's fleet and 7,465 passengers, 1,007,313 lbs. of express freight and baggage and 120,278 lbs. of mail were carried.

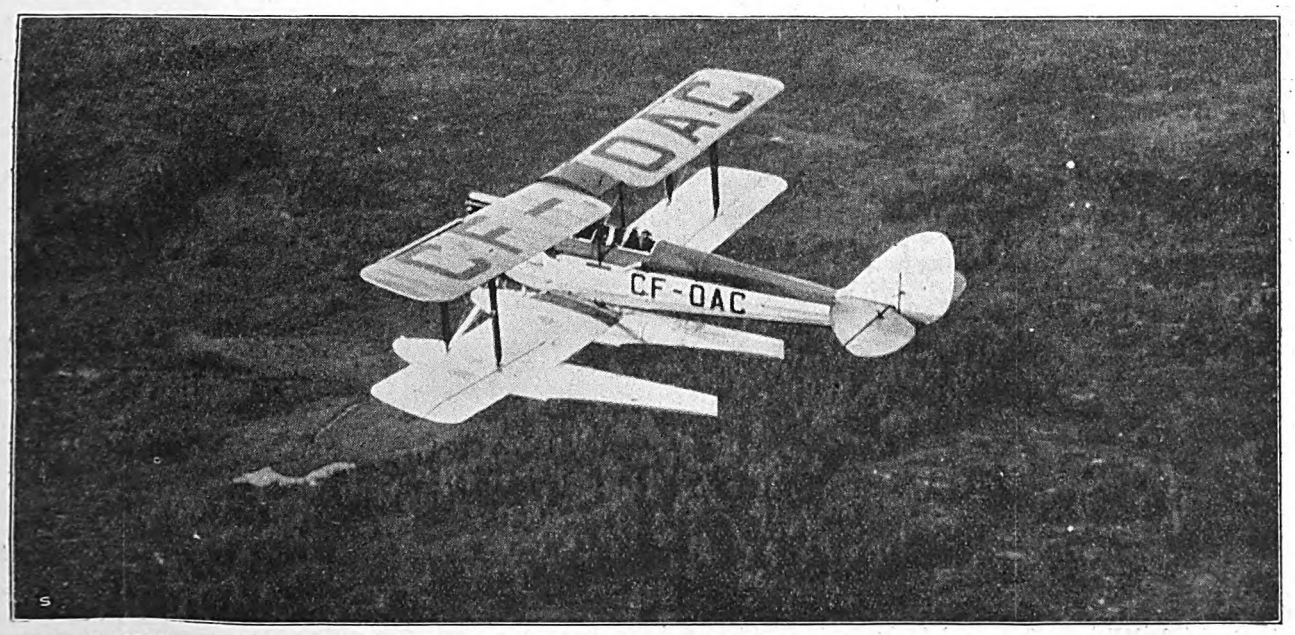
In January 1929 a second base for the Patricia district of Ontario, a base in Northern Saskatchewan and one for the Mackenzie River area were opened. From the latter base an air route to Atlavik was opened at this time.

In the 1928-29 season the company's fleet flew 272,475 miles in 2,970 hours and carried 3,764 passengers, 547,368 lbs. of express and baggage and 105,622 lbs. of mail. Four Fokker Super-Universals and one Fokker Trimotor were added to the fleet.

In the summer of 1929 further bases were opened in British Columbia and the fleet was again added to with two Fokker Super-Universals, six Fokker F.XIVs, three Boeing 40-Bs and one Junkers monoplane. For the 1929 summer season the company flew 505,615 miles in 6,043 hrs. and carried 8,630 passengers, 1,114,217 lbs. of baggage and 161,983 lbs. of mail.

The total figures for the company since its inauguration to the end of 1929 are as follows:—

Miles flown	1,469,117
Flying hours	17,792
Passengers carried	23,789
Express Freight and baggage carried ..	3,274,961 lbs.
Mail carried	399,745 lbs.



IN CANADA.—A Gipsy-Moth belonging to the Ontario Provincial Air Service on forest patrol in the Rainy River district of Northern Ontario.

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A correspondent at Winnepeg writes:—

Our western mail is away to a good start. There is nothing more to say until the service is old enough to have a few figures, and errors.

After the disappointment of the overrated Fokker 14s the Boeings had a turn of popularity, but now the pilots are back again in favour of the Fokker. Its better visibility is one reason, and the other is that when making forced landings in the dark a few bushes don't matter so long as one knows the wing is still quite a bit in the air.

The lower wing of the Boeing would have made it bad for Buchanan the other night when he ran out of gas on a test trip. He ran through three fences while feeling for ground. His flares disappeared behind in the snowstorm and did no good, his landing lights merely illuminated the snow-flurries. Just before landing he banked one wing-tip over a poplar grove and landed in scrub deep enough to inconvenience a biplane. There was a small stump hole in the fuselage, but he flew on in the morning.

The beacon is quite a good effort. The public are of course disappointed, having expected to dispense with street and domestic lighting after its inauguration. They cannot understand how the Neon is visible at any distance, and as the beam light leaves little or no "track" in our clear air they are disillusioned about that too.

I went to the field to see the first mail leave. There was a big crowd, all of whom were anxious to get into the floodlight, and their transparency left something to be desired in view of the pilot's needs.

A NEW AERIAL BEACON.

On the evening of Mar. 28, at Croydon, various people were given a chance of seeing at work the latest addition by Philips Lamps Ltd. to their range of aviation lighting equipment. This is a new kind of Neon tube of remarkable potency and economy, about which more anon. The tube was demonstrated in a beacon placed close to the new luminous landing Tee and at the end of the path of flares laid out for the Argosies which were expected back from Aintree.

Croydon illuminated for night-flying is certainly a fine sight. The Summer afternoon-tea flights by Imperial Airways Ltd. over London are so successful that the writer suggests joy-riding by night. All this coming Summer there will be so much night-mail flying that Croydon will have to be lit up most of the time. Imperial Airways could take advantage of this to show people London and the countryside from the air by night.

It would be good propaganda. Probably on hot nights an open-cockpit machine would be more to popular taste and might start a new fashion for keeping cool. The idea admits of elaboration, and trips for tired Londoners might be organised to various seaside resorts where they could bathe and dine before returning to Town.

Just before we started out to inspect the beacon, the two Argosies landed down the path of the flood-light and made a striking picture.

Mr. R. J. Castendijk, who is in charge of the Aviation Department of Philips Gloeilampenfabrieken, the parent company of the British organisation, was responsible for the design of the new beacon and Neon Tube. The beacon is a glass pillar, square in section and about five feet high. Inside are two parallel Neon tubes three feet long, only one of which is used,—the other is for emergency use and comes in action automatically.

The advantages of the Philips Neon tube are first that it operates on the normal power-supply of low voltage (say 200 to 300 volts), whereas the normal type uses high tension current of some thousands of volts which makes the complication of transformers necessary. Also such a high voltage introduces an element of danger.

Secondly this Tube is more efficient and produces one candle-power for ⅔ watt as against 1.2 watt per candle-power of the normal type. Thirdly the Philips tube produces so much more light per unit length that Mr. Castendijk told us eight three-foot lengths of his Tube would replace 16 20-foot lengths of the normal type.

A more technical description of this new Beacon will be given in the next Engineering Supplement of The Aeroplane as lack of adequate space makes this impossible in the current issue. The light will be operating at Croydon for some time to come, and people who are interested should get in touch with Mr. Knight, of Philips Lamps Ltd., 145, Charing Cross Road, London.

THE WONDER SHIP.

This is from *The Observer* of March 31 (not April 1 fortunately):—

THE WORLD'S LARGEST FLYING MACHINE.

THIS WEEK'S TRIAL AT FRIEDRICHSHAFEN.

(From Our Own Correspondent.)

Friedrichshafen, March 26.

Next week a new type of giant aeroplane for passenger service will start on its first trial flight here. In the distance it looks like a squadron of twelve monoplanes flying abreast. The wings are joined together into one enormous rump, which can accommodate a thousand passengers.

It will be the largest flying machine on earth, leaving even Do x far behind in bulk. Its name, "Rumpfgeschwader," which is in English "Rump Squadron," is well chosen.

THE CAPITAL OF IMPERIAL AIRWAYS.

The Directors of Imperial Airways Ltd. have decided to call up the balance of uncalled capital which amounts to 5s. per £1 share. The present paid-up Ordinary capital amounts to £474,170 and the final call will provide a further £124,998. The total issued capital is £624,168.

FOR RUGBY ENTHUSIASTS.

Imperial Airways Ltd. have made special arrangements for those who wish to see the International Rugby Match at Colombes Stadium on April 21. For £8 return fare one can leave Croydon at 08.00 hrs. on Apr. 18, 19, or 21, for Paris, and come back either at 18.30 hrs. on Apr. 21 or 08.00 hrs. on Apr. 22.

A car, which leaves Colombes Stadium at 17.15 hrs., will collect passengers who are returning by the 18.30 hrs. machine. A map will enable them to track it to its lair.

THE ACCIDENT AT MARDEN.

The inquest on the bodies of Mr. and Mrs. A. Hodges, who were killed in the accident at Marden on Feb. 10, was resumed at Staplehurst on Mar. 29. Previous references have appeared in The Aeroplane for Feb. 12 and Feb. 19. The inquest had been adjourned to await the recovery of the pilot, mechanics, and third passenger, who were all injured. The inquest was conducted by Major Eric Clarke.

According to *The Times* M. J. Nevot, the pilot of the machine, whose evidence was interpreted, said that they first returned to the aerodrome to change five or six sparking plugs. Everything was then satisfactory until, just after passing Maidstone, he heard a very loud crack and the machine began to dive. He attempted to hold the nose up, but it answered his controls very slowly. It then began to glide. Looking round, he saw that the whole right-hand tail plane was broken.

He then made a wide turn towards the Marden landing ground. He tried to avoid some sheep on the ground, and as he throttled down the engine the machine shot up into the air. The control produced no effect, and the machine crashed. He waved his hand to call the mechanic, but did not give instructions to the passengers to go to the back. If everything had been normal with the machine, he would have landed successfully.

An official of the French Air Union said that the machine was put in commission in 1921, and rebuilt in October 1929.

MR. T. NEVILLE STACK.

Mr. T. Neville Stack, A.F.C., who was appointed Superintendent of Flying to National Flying Services Ltd. on its formation, has resigned his post.

Mr. Stack, besides doing a great deal of work in organising the flying arrangements at Hanworth and at the various subsidiary aerodromes now operated by N.F.S., has also been responsible for choosing sites for new aerodromes and advising local authorities on their choice.

As most people know, Mr. Stack is a first-class pilot and all the shows at Hanworth have proved his ability as a pilot and organiser.

Mr. Stack is now free to accept any post where first-class organising and piloting are needed. His performances in the past on aeroplanes of all types are famous, and his good organising work for the Lancashire Aero Club in the past and more recently for N.F.S. should provide sufficient evidence of his ability.

A VACATION.

Mr. Dermot Mooney has disposed of his interest in the Steel Wing Co. Ltd., and has retired from the board of that company, thus, for the present, severing a connection with the aircraft industry which has lasted fifteen years. To Mr. Mooney and his chief engineer, Mr. Donald Emby, is largely due the fact that the problem of constructing metal wings which equalled wooden ones in strength without exceeding them in weight was first solved. And this achievement made practicable the All-Metal Aeroplane.

The work done by Messrs. Mooney and Emby between the years 1915 and 1918 provided the foundation on which by far the greater part of British metal aircraft construction of the present day is based. Before 1915 constructors had designed and built metal aeroplanes of tubes and girders, but they were heavier than wood, and not so strong weight for weight. In this connection there is interest in the fact that Mr. E. V. Sassoon, now Sir Victor Sassoon, spent a considerable sum on experiments in the construction of metal wings at Brooklands in 1911.

In 1915 Mr. Mooney had brought to his notice the idea of using thin corrugated metal strip as a constructional material, and saw in it the solution of the main problem of metal construction, that of the wing. He founded the organisation now known as the Steel Wing Co., and in the face of difficulties exceptional even for a pioneer he demonstrated the practicability and soundness of the system.

By 1917 the Steel Wing Co. were turning out hundreds of corrugated metal-strip ailerons for aircraft on active service. In May 1917 they sent for test to the Royal Aircraft Factory the first wing with corrugated spars and the test report stated that the wing had demonstrated that it was practical to make wings of metal which would equal wood in strength and weight. In October 1918 the first British aeroplane of corrugated metal strip construction was in the air. This, the MR1, was produced in collaboration with the

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British and Colonial Aeroplane Co. Ltd., now the Bristol Aeroplane Co. Ltd. That firm made the fuselage, and the Steel Wing Co. made the wings.

The Steel Wing Co. continued to develop their system after the War, and, amongst others, they designed and produced steel wings for the Avro 504k and the Avro Aldershot, the largest all-metal machine of its day. In 1923 they designed and had adopted for service a steel wing for the D.H.9a, and this design of wing is to-day, in a slightly modified form, being produced in quantity for use in the all-metal Wapiti. Later a steel wing was designed and made for the Gloster Gorcock and Gamecock machines and for one of the De Havilland types.

In 1927 the Steel Wing Co. became closely associated with the Gloster Aircraft Co. Ltd., Mr. Mooney relinquishing his controlling interest, but remaining a director until the beginning of this year.

THE FOKKER DECENNARY.

Congratulations to Mr. Anthony G. Fokker and to his able assistants Mr. B. Stephan and Mr. E. Smits on the tenth anniversay of the foundation of the Fokker Company in Amsterdam. Few people deserve congratulations more than do the Fokker Company, for the Fokker cabin machines, whether single-engined, twin-engined or triple-engined, have done most valuable work in demonstrating the possibilities of Civil Aviation all over the World.

We in this country owe Mr. Anthony Fokker no particular gratitude for his contribution to the War 1914-18. And yet in a way we ought to be grateful to him, for the "Fokker scourge" of 1915-16 was the thing above all others which forced us to put forth our best efforts.

When the Armistice came and there was obviously no more chance of selling war-machines, Mr. Anthony Fokker shipped train-loads of material from his German factory into Holland, but something like two years passed before his firm in Holland was fully established. To quote a delightful phrase in the splendid publication which has just been produced by the firm to celebrate this tenth anniversay, "When the N.V. Nederlandsche Vliegtuigenfabriek was established, we naturally acquired the latest designs made by the founder of our firm during his stay abroad."

That is to say the firm started business with the famous type of machine with which the German Flying Corps put up its last magnificent fight of the War against overwhelming odds. Since then Mr. Anthony Fokker has made wonderful progress and from the British point of view one of the most satisfactory features about the progress of his aircraft has been that the finest flights of Fokker aeroplanes have been made with British engines. The Napier Lion water-cooled engine, the Bristol Jupiter and Titan, and the Armstrong Siddeley Jaguar and Lynx have contributed more than any other engines to Mr. Fokker's success.

To commemorate the firm's tenth anniversary of peaceful construction the firm has produced a volume, which it modestly calls a bulletin, consisting of 172 excellently printed pages in English, French and Spanish, all about the history and the output of the Fokker firm. Not only does the volume contain photographs of all types of Fokker aircraft from the beginning, but it also contains 32 pages of complete specifications, dimensions and performance figures, together with scale drawings of each type.

The book is an extraordinarily interesting history of all phases of aviation from one point of view, that of the Fokker firm. It is also an education in the aeronautical language of France and Spain, for it deals with aeronautical history, the engineering side of aeronautics, the design side, and in places with the more highly technical side, so that in every way it is a desirable possession.

Mr. Stephan, the manager of the Fokker Company, tells one that the firm will be glad to send it free of charge to pilots, engineers and other responsible persons concerned in civil or commercial aviation. If the demand and supply is anything like what it ought to be, judged by the interest and value of the book, the output ought to make quite a serious hole in the Fokker Company's profits.—C. G. G.

TITANINE.

Flt. Lt. A. L. Chick, A.F.C., who was placed on the Retired List of the Royal Air Force in May last, has joined the Board of Titanine-Emaillite Ltd., Empire House, 175, Piccadilly, London, W.1, the well-known manufacturers of aeroplane dope, varnish and lacquer.

THE LONDON TERMINAL AERODROME.

ANALYSIS OF FIGURES FOR PAST WEEK.

Trips per Day.—Sunday, 6; Monday, 17; Tuesday, 18; Wednesday, 19; Thursday, 19; Friday, 19; Saturday, 18.

IMPERIAL AIRWAYS LTD.:
London—Egypt—India: London—Le Touquet—Paris—Basle—Zurich: London—Ostend—Brussels—Cologne and return: Machines 38, passengers 270, freight 17¼ tons. India Route: Inward, passengers 0, mail 642 lbs.; outward, passengers 0, mail 699 lbs.

AIR UNION:
Paris—London: Machines 37, passengers 111, freight 8 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 12, passengers 52, freight 5¼ tons.

SABENA:
Brussels—London: Machines 17, passengers 29, freight 3¼ tons.

DEUTSCHE LUFT HANSA A.G.:
Amsterdam—London: Machines 12, passengers 36, freight 2¾ tons.

MISCELLANEOUS:
British machines 0, passengers 0.
Foreign machines 0, passengers 0.
Total number of trips by British machines, 38, carrying 270 passengers. Foreign machines, 78, carrying 228 passengers.

COMPARATIVE FIGURES.

Week ending Mar. 29:
Machines, 116; Passengers, 498; Crews, 305; Total personnel, 803.
Corresponding week, 1929:
Machines, 176; Passengers, 1,069; Crews, 341; Total personnel, 1,410.
Corresponding week, 1928:
Machines, 119; Passengers, 596; Crews, 226; Total personnel, 822.
Corresponding week, 1927:
Machines, 79; Passengers, 322; Crews, 125; Total personnel, 447.
Corresponding week, 1926:
Machines, 98; Passengers, 516; Crews, 125; Total personnel, 641.
Corresponding week, 1925:
Machines, 92; Passengers, 344; Crews, 116; Total personnel, 460.
Corresponding week, 1924:
Machines, 44; Passengers, 179; Crews, 76; Total personnel, 255.
Corresponding week, 1923:
Machines, 93; Passengers, 417; Crews, 156; Total personnel, 573.
Corresponding week, 1922:
Machines, 60; Passengers, 137; Crews, 100; Total personnel, 237.
Corresponding week, 1921:
Machines, 58; Passengers, 210; Crews, 78; Total personnel, 288.
Corresponding week, 1920:
Machines, 36; Passengers, 45; Crews, 40; Total personnel, 85.

CROYDON NOTES.

Quite a lot of business was done in connection with the Grand National. Imperial Airways Ltd., sent two fully-loaded Armstrong-Whitworth Argosies to Liverpool, and Mr. Bernard Wilson flew his Desoutter there for the *Daily Mail*. National Flying Services sent an air taxi there, and altogether there were about twenty machines involved.

According to the Sunday newspapers, the Handley Page 40-seater "Hush Hush" aeroplane will be in commission and running for Imperial Airways by mid-Summer. The description "Hush Hush" is delightful, because a more or less full description of these aeroplanes has appeared in some paper or another about once a month ever since they were first designed, and the fuselage of one of them was stealthily exhibited at Olympia with every precaution of secrecy that Mr. Handley Page could devise.

Imperial Airways evidently expect a big rush of traffic this coming Summer, and have already taken on a number of new pilots. [Judging by the drop in traffic figures this past several weeks they seem optimistic.—ED.]

Capt. McIntosh has been busy getting the Fokker (Lynx) tri-motor into trim recently, and Major Andrew Holt (of the Aircraft Investment Corporation) is expected back from Canada shortly. Major Holt is one of those business men who realise how time can be saved in business by flying, and he is expected to do some intensive flying up and down Europe in his Fokker during the Summer.

The dust nuisance, all unchecked by any Air Ministry device, is upon us again, and with the numerous departures and arrivals which are scheduled, we suppose that we shall live in the midst of an almost continual dust storm, which will fill our eyes, ears, offices and inkwells.

Will the gentleman who has lately shown such an interest in the accessories of other people's cars parked at the Aerodrome, kindly communicate with Mr. Ruffy Scrobinson, who would like to have a word with him. It is suggested that the gentleman might be accommodated with several new facial accessories in the way of bumps, swellings and knobs, while other facial accessories might be flattened out of existence.—SPRY.

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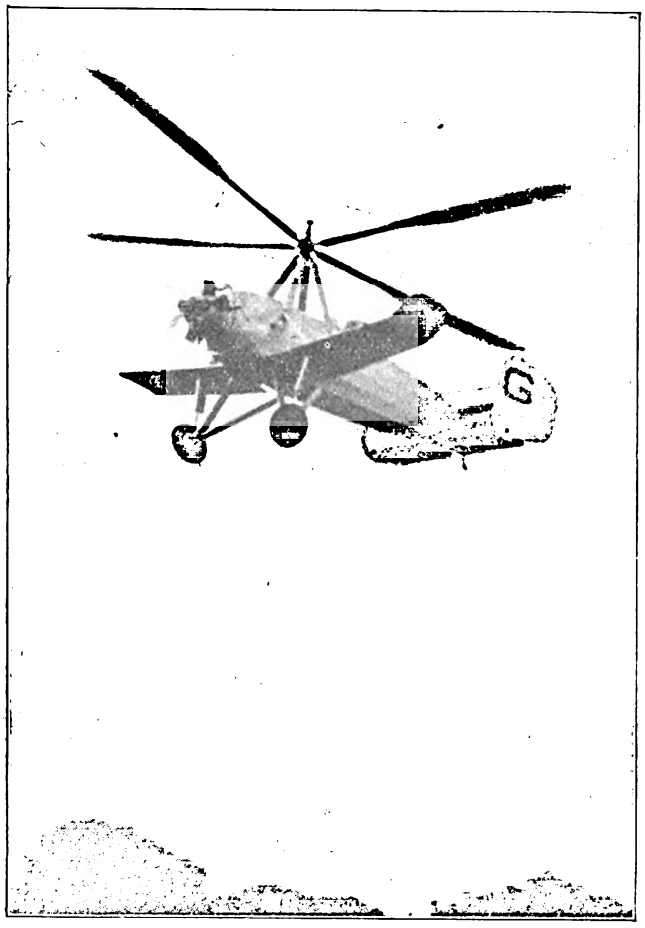

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IMPORTANT DATES.

April 3.—M. M. P. Grimault's lecture before the R.Ae.S.
April 5.—N.F.S. Meeting at Reading.
April 5.—W.R.A.F. Re-Union Dinner.
April 6.—The third Ashwell-Cooke Challenge Competition at Lympne.
April 9.—Hockey Unit Tournament Final.
April 9.—Assoc. Football, R.A.F. Junior Cup Final.
April 12.—N.F.S. Meeting at Hull.
April 16.—Boxing, R.A.F. Team Championships.
April 17.—Spring Session at Cranwell ends.
April 19.—Leicester Flying Meeting (Leicestershire Aero Club)
April 21, Easter Monday.—Meeting at Hanworth.
April 26.—N.F.S. Meeting at Leeds.
April 26.—No. 45 Squadron Re-Union Dinner.
May 5.—R.A.F. Staff College, Second Term begins.
May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome.
June 7.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—R.A.F. Garden Party at Manston.
June 15.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gwynn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
July 5.—King's Cup Air Race (Royal Aero Club—Heston Air Park).
July 13.—N.F.S. Meeting at Leeds.
July 19.—N.F.S. Meeting at Hull.
July 20—Aug. 7.—International Touring Competition.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

THE SURVEYORS' PROGRESS.

Mr. and Mrs. Alan Butler left Heston Air Park on Mar. 20 for South Africa, as reported in THE AEROPLANE for Mar. 26. They reached Sollum, Egypt, on Mar. 25. A report states that trouble with an oil-tank has delayed them at Abukir, Egypt.

A BOAT-RACE WARNING.

On Apr. 12, the Oxford and Cambridge Boat Race will be rowed. The Air Ministry requests pilots of aircraft not to fly over the course lower than 2,000 feet either before the start or during the Race. Every year after the Race THE AEROPLANE has had to criticise the dangerous way in which certain aircraft are flown during the Race.

A disaster over such a crowd, though spectacular, would seriously affect civil aviation and retard the progress now becoming apparent. If pilots want to commit suicide they might at least go and do so quietly.

SAFETY BELTS AND SAFETY HARNESS.

Safety belts and safety harness are essential fitments in open-cockpit aircraft, and cabin machines as well,—for a bump on the roof may easily knock a pilot out. The sixth notice of this year to aircraft owners and ground engineers gives details of the Air Ministry requirements for the provision and maintenance for such fitments.

THE PICTURE ON THE FRONT.

This week the picture on the front cover shows a conventionalised view of the De Havilland Aerodrome at Stag Lane. On the left are the firm's offices. The buildings furthest in the background are the De Havilland School of Flying. Nearer to the front are the main aeroplane shops. The range of roofs in the middle foreground cover the Gipsy engine-shop, and nearer are the drawing-office, canteen and so forth. To the right is the Club House of the London Aeroplane Club, and to the right and further away is the De Havilland Co.'s aeroplane garage and the range of private lock-ups. These buildings alone house, on an average, fifty privately-owned aeroplanes.

"THE NOTCHED INGOT."

The current issue of *The Notched Ingot*, the quarterly works magazine of The Hoyt Metal Co., of Great Britain, Ltd., contains interesting articles on lined bearings.

The magazine states that Hoyt Number Eleven Metal is employed in the Armstrong Siddeley Genet Major engine, and also in the Jaguar engines of the Imperial Airways fleet of Argosies. Hoyt bearings were also used in Mr. F. C. Chichester's flight in a Gipsy-Moth to Australia.

NEW COMPANIES.

AVIATION TOURS LTD.—Private company. Registered Mar. 25. Capital, £1,500 in £1 shares. Objects: To establish, maintain and work lines of aeroplanes, seaplanes and taxiplanes and aerial conveyances from and to all parts of the world, to undertake and/or finance flying exhibitions or flying race meetings, etc.

The directors are E. B. Fielden (permanent managing director and chairman), Fairleigh, Draughton, Skipton, aeroplane pilot. F. W. J. Grant, 10, Purley Park Road, Purley, engineer. Solicitors: Edridge, Son and Marten, Croydon. Registered office: Stafford Road, Wallington, Surrey.

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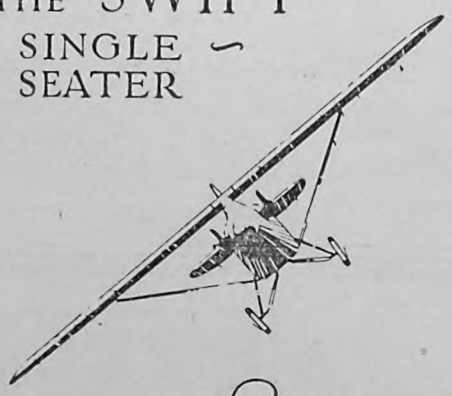

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Brian Lewis and C. D. Barnard Ltd.—Private company. Registered Mar. 24. Capital, £4,000 in £1 shares. Objects: To acquire from Malcolm Campbell (London) 1927 Ltd. (inter alia) the goodwill of their business as agents for and dealers in aeroplanes.

The subscribers are: C. D. Barnard, 25, Monmouth Road, Bayswater, W.2, aeroplane pilot. B. E. Lewis, 11, Charles Street, Berkeley Square, W.1. (Director, Malcolm Campbell (1927) Ltd.). Solicitors: Middleton, Lewis and Clarke, 22, Gt. St. Helens, E.C.3.

MORTGAGES AND CHARGES.

Air Taxis Ltd.—Debenture dated Mar. 19, 1930, to secure £3,750, charged on the company's undertaking and property, present and future, including uncalled capital. Holders: W. L. Hope, "Koubbeh," Northwick Circle, Kenton, Middlesex.

PERSONAL NOTICES.

Births.

STATON.—On Mar. 29, at Kenbane Cottage, Ducks Hill, Northwood, Middelesex, to Norah (*née* Workman), wife of Flt. Lt. W. E. Staton, M.C., D.F.C.—a son.

WIGGLESWORTH.—On Mar. 25, at Singapore, to Peggy, wife of Flt. Lt. C. G. Wigglesworth, R.A.F.—a son.

Forthcoming Marriages.

COMBE—BAINBRIDGE.—The engagement is announced between Flt. Lt. Gerard Combe, R.A.F., third son of Mr. and Mrs. Percy Combe, and Brenda Mary, elder daughter of Mr. and Mrs. Hugh Bainbridge, of Killeen, Lakeside Road, Bournemouth West.

KELLY—GARNETT.—The engagement is announced of Flt. Lt. J. V. Kelly, R.A.F., North Weald, and Beryl, younger daughter of Mr. and Mrs. F. Garnett, the Pryors, Hampstead, London. The wedding will take place on April 30.

LEES—THOMPSON.—The engagement is announced of Sq. Ldr. Alan Lees, R.A.F., elder son of Mr. and Mrs. Maurice Lees, Park Bridge, Ashton-under-Lyne, and Norah Elizabeth, daughter of the late John Thompson and Mrs. Thompson, St. Oswalds, Victoria Road, West Hartlepool.

Deaths.

PRATT.—On Mar. 24, at Worthy Down, Hants, as the result of a flying accident, Percy James Pratt, Plt. Off., No. 58 (B) Sqdn., R.A.F.

Mr. Pratt entered the R.A.F. with a short service commission in February 1929 and after a course of flying training at No. 1 F.T.S., Netheravon, he was posted to No. 58 (B) Sqdn.

WHITE.—On Mar. 24, at Worthy Down, Hants, as the result of a flying accident, Ernest Richard White, Flg. Off., No. 58 (B) Sqdn., R.A.F.

Mr. White passed out of the R.A.F. College, Cranwell, in December 1927 and was posted to No. 58 (B) Sqdn., Worthy Down. He won the Aeronautical Engineering prize at Cranwell.

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MISCELLANEOUS ADVERTISEMENTS.

All advertisements for this column should arrive at this office by first post Monday, to ensure insertion.

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Special PREPAID Rate—18 words 4/6, 3d. per word after; 13 insertions, 18 words, 4/-; 26 insertions, 18 words, 3/6; 52 insertions, 18 words, 3/-, 2d. per word after. Situations Wanted ONLY—18 words 1/-. Box No. 6d. extra.

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Aeroplane Wheels, New, fitted with Dominion 26 x 2½ heavy tread tyres, and new tubes. Pair with axle, 70s. carriage forward; K.L.G. Plugs F.7, 2s. 3d.; Altimeters, 10s. 6d.; Shock Absorber, 5-8 in., 6d. per yard; Aero bolts, nuts, washers, etc., 7lb. bag, 4s. Above postage paid. Send for illustrated list. Coley Ltd., Ordnance Works, Queen Elizabeth Road, Kingston-on-Thames.

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NEW SPARTAN: Cirrus III engine; unused. £450. Any of these machines may be purchased on deferred payment. Telephone: Byfleet 436 and 437. Station, West Weybridge. S.R.

Blackburn "Bluebird" side-by-side seating, all-metal construction. Price £795. Sole world's distributors, Auto-Auctions Limited, Burlington Gardens, Old Bond Street, London. Aerodrome: Heston.

D. W. Aircraft Co., Brooklands Aerodrome; have for sale several S.E.5as, reasonable figure, new condition with C. of A. Telephone, Byfleet 331.

For Sale, Bristol Scout G-EAGR in good condition with 80 Le Rhone engine as new. Suitable for ground instruction or for flying within 3 miles of an aerodrome, etc. £30 or near offer.—Wray, R.A.F., Grantham.

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Joy-riding.—Le Rhone 504K Avro, Splendid condition. New March, 1929. Complete joy-riding outfit with good stock of machine and engine spares. Spare engine, field screens. Light Van. £200 or nearest. Bint, 181, Yardley Road, Acocks Green, Birmingham.

National Flying Services Ltd. (See page 625.) Quick deliveries. New or second-hand machines.

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£375. Mark II Cirrus Moth. C. of A. 9 months. Reconditioned. Repainted.—Phillips and Powis Aircraft (Reading) Ltd. Sonning 114.

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Air Survey Co. Ltd., 3, Grosvenor Gardens, S.W.1. (Victoria 5903.) Dum Dum, Calcutta, and Monkey Point, Rangoon.

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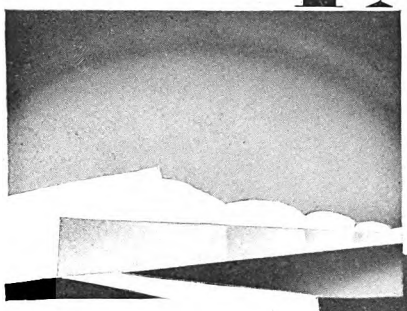

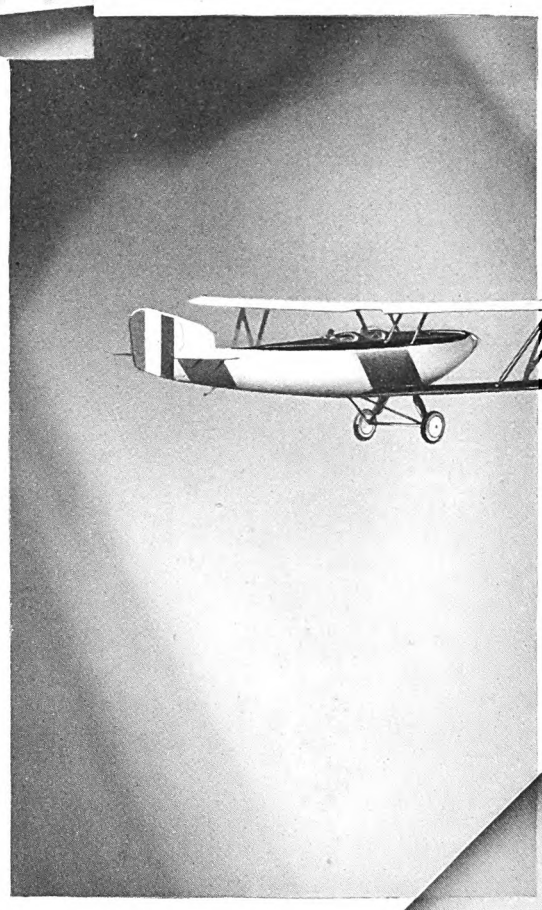

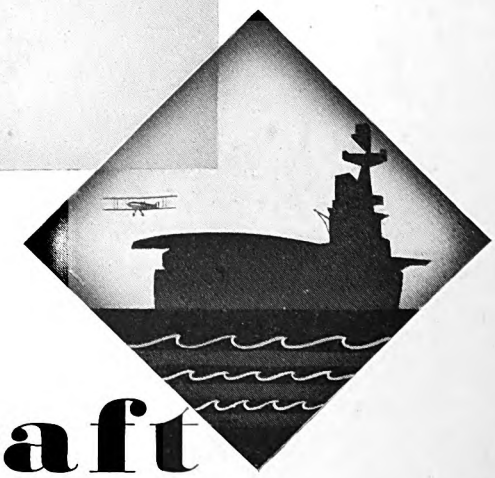

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ON THE IMPORTANCE OF PORTUGAL.—I.

Regular readers of THE AEROPLANE will remember that from time to time reference has been made to the importance of Portugal in general, and of the Harbour of Lisbon in particular, to future developments of Air Mail routes from England to various other parts of the world. Also reference has been made in this paper to the fact that so far aviation has not been much developed in Portugal and that strenuous efforts are being made by a French concern, known commonly as the "Spela" (which stands for *Sociedade Portuguese de Estudos e Linhas Aereas*), to get control of all Civil Aviation in Portugal.

The big idea has been that the French should get a monopoly of civil flying and that even Portuguese civil aviators should only be allowed to fly over their own country by kind permission of the French. Naturally this has caused bad feeling. And the situation, as will be seen hereafter, is of great importance to us in England.

These intrigues by the French have already caused a clash with the German Junkers firm and the German Luft Hansa. The Germans have an air line running from Berlin across France, round the Eastern end of the Pyrenees to Madrid, whence the line is intended ultimately to go on to Seville. There is a scheme actually in being to run an air line with big airships from Seville to North America, and possibly by flying-boats to North and South America. As an off-shoot of this, the Luft Hansa started to run a line from Madrid to Lisbon, thus putting German business men directly into communication with the Capital of Portugal.

People are apt to forget that though Portugal itself is quite a small country—only about the size of England—it is in fact the third greatest Colonial power in the world, for the British Colonies plus Overseas Dominions, and the French Colonial Empire, are the only Colonial possessions greater than those of Portugal. Angola, Portuguese East Africa, Goa, Macau, and various odd but fertile islands all over the Globe make Portugal rich, and will make her much richer. Consequently, there is every reason why the astute business men of Germany should cultivate business with Portugal, so that German manufacturers may find an outlet in Portugal's vast Colonial dominions,—as we are so slow about doing so.

Furthermore, the Luft Hansa people, who always have their eye fixed on the possibilities of long-range air lines all over the World, and who already run air lines from Berlin through Russia to Persia, and have extensions planned through Siberia to Pekin, naturally have views on the possibilities of Lisbon as a jumping-off place for flying-boat lines to North America by the Azores and to South America by the Canaries.

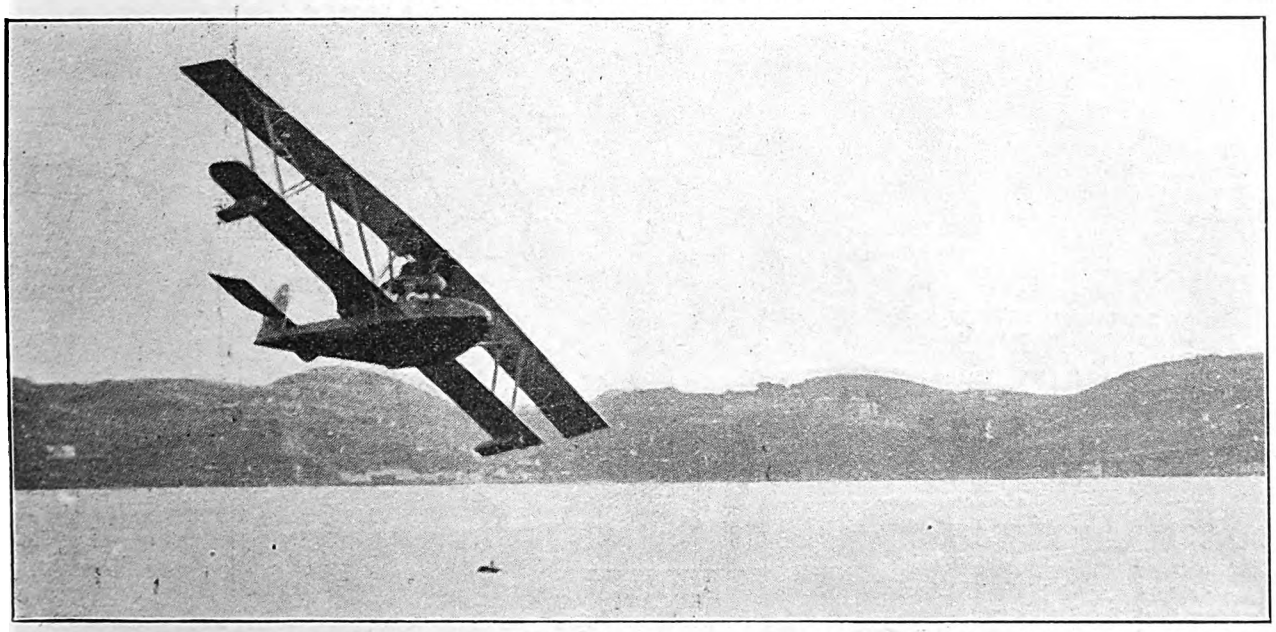
The French, as is probably known to most readers of this paper, already run an air-mail line from Paris down the East Coast of Spain over the Straits of Gibraltar and along the West Coast of Northern Africa to Dakar. Thence a special service of fast steamers takes the mail across to Port Natal on the Coast of Brazil, whence they are flown by this same French air line down to the East Coast of South America to Buenos Aires, capital of Argentina. Thence they are flown over the Andes to Chile.

The moving spirit of this French line is M. Latécoère, a manufacturer of aeroplanes, and the air line is called the Compagnie Aéropostale. By a curious coincidence M. Grimault, the Chief Engineer of the line, lectured to the Royal Aeronautical Society last week on the work of his firm, and a report of his lecture appears elsewhere in this paper. So readers may see for themselves how much ground we have to make up—or, if you like to look at it another way, how much pioneer work has been done for us.

BRITISH INTERESTS.

Anyhow the result is that British business firms, who do the greatest amount of business in South America, and even great British shipping lines which annually carry tons of mail to South America, when they want to get important letters or documents through in a hurry to their

"THEY ARE ILL DISCOVERERS THAT THINK THERE IS NO LAND WHEN THEY CAN SEE NOTHING BUT SEA."—*(Bacon, 1561—1626.)*



THE GATE-WAY OF EUROPE.—A flying-boat of the Portuguese Naval Air Service, flying over the Tagus, photographed from the Port of Bom Sucesso from which Vasco da Gama sailed on the first voyage by sea to India. From the new airport on the Tagus above Lisbon will start some day the great air lines to North and South America and West Africa and, in time of war, to the Mediterranean and the East.

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own business houses in Brazil or in Argentina or in Chile, have to send them across to Paris and have them flown by a French air line to West Africa and down the coast of South America.

One hopes that all readers of this paper will admit that such is not a fit and proper state of affairs for the greatest sea-faring nation in the World, and in fact, the greatest air-faring nation in the World, as we are. With our world-wide organisation of sea transport, and our enterprise as individuals, surely we ought to be running the air mails of the World between Europe and South America.

With a flying-boat doing 120 m.p.hr. Lisbon is only 8 hours' flying from Plymouth. Thence there is good flying to Teneriffe and St. Vincent. And thence the journey by St. Paul's Rocks and Fernando Noronha is not so very difficult.

Anyhow, Germany, having her eye on the possibilities of Lisbon as a port for great overseas lines, and France having possibly similar ideas in view ultimately, but with an immediate eye to getting control of Civil Aviation in Portugal, there was naturally a clash of interests and ideas. And the immediate effect was that the French tried to prevent the Germans from flying from Madrid to Lisbon. Actually legal action did not go very far,—for the German interests and the French interests came to an agreement by which the Luft Hansa Junkers machines are now allowed to fly between Madrid and Lisbon.

What precisely was the cause of this agreement between two essentially hostile interests is not quite easy to understand. Possibly there may have been some idea that British interests might step in and develop aviation in Portugal as it should be developed. Possibly the agreement may have been due to the fact that there is very properly in Portugal a considerable faction which believe in "Portugal for the Portuguese." Be that as it may, the fact remains that German machines do fly quite regularly once a week between Madrid and Lisbon. And the fact also remains that the French Spela interests are still trying to get a monopoly of civil aviation in Portugal, and that if we do not do something about it, we shall find our oldest Allies, the Portuguese, and ourselves, frozen out of flying in Portugal.

Seeing Portugal.

With these facts in mind, and realising the immense possibilities of Portugal for British Aviation in the near future, when we are producing really high-speed long-range mail-carrying flying-boats, one resolved to go to Portugal to see the position for oneself. The idea was to combine a holiday with this tour of investigation, and make a business out of pleasure. As it turned out, thanks to the extraordinary kindness and hospitality of a number of people, whom one met for the first time after arriving in Lisbon, the trip turned out to be rather making a pleasure out of business.

What Portugal Has Done.

The first thing to be said about Portugal and the Portuguese people is that Portugal is about the least understood country in Europe. Most educated people in this country know that some few hundreds of years ago, between 1400 and 1500 A.D., Portugal produced some of the World's greatest navigators and explorers.

Encouraged by Prince Henry, surnamed the Navigator, one of the sons of the King of that period, Portuguese sailormen went to all parts of the World, where no white man had ever been before. In 1419 the Portuguese discovered Madeira. In 1434 Gil Eanes discovered the Gold Coast. In 1482 Diogo Cao discovered the Congo. In 1488 Bartolomeu Dias rounded the Cape of Good Hope. And, the crowning achievement, in 1497-93, Vasco da Gama discovered the sea route to India.

Later on, in 1519, Fernando Magalhaes (commonly called Magellan) began the first circumnavigation of the Earth. He went through the Straits which bear his name, and died in the Pacific. The voyage home by India and the Cape was completed by his lieutenant.

There is fairly good historical basis for saying that the Genoese explorer, Christopher Columbus, who was financed by Ferdinand of Spain in his voyage which discovered the West Indies, was encouraged to make that voyage by information which he received from a Portuguese sailor who had been blown out into the Atlantic, had found land far away to the West and had somehow found his way back again.

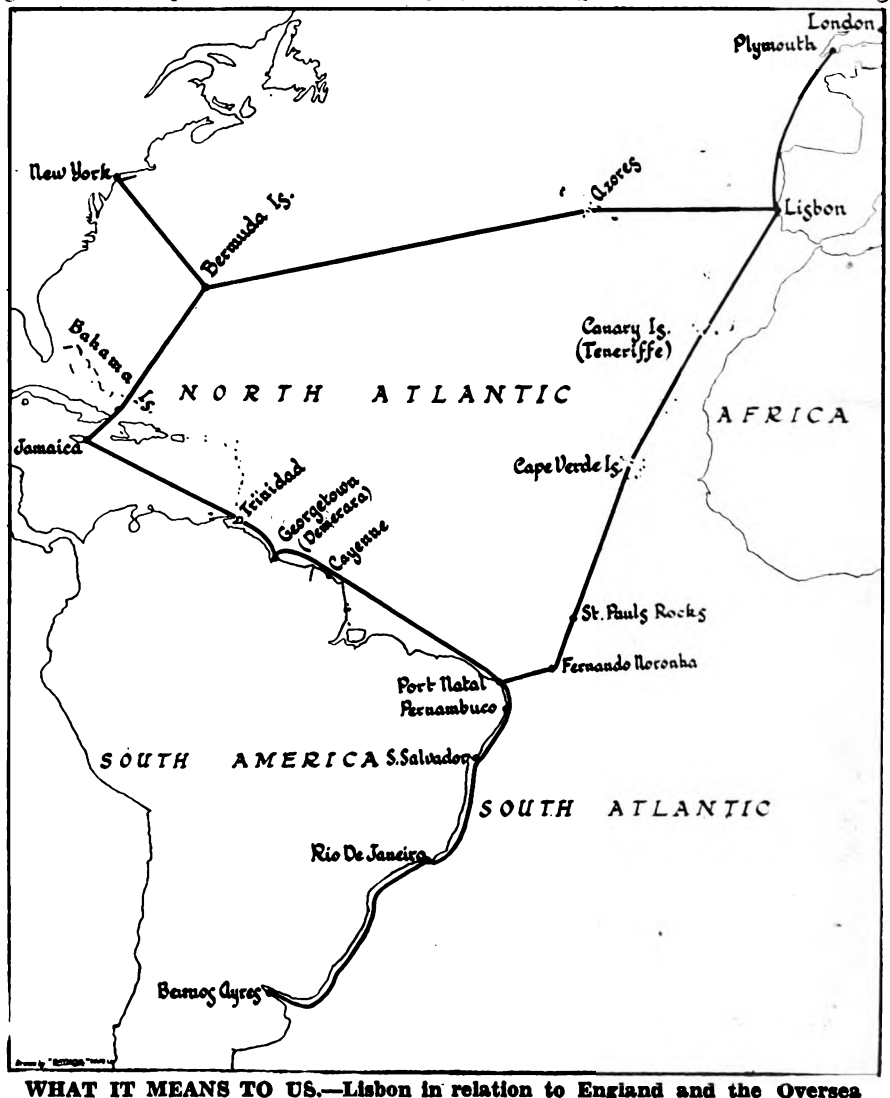
Whether that is historically true or not cannot be proved. But at any rate, the historical facts are that long before Columbus discovered the West Indies, Portuguese venturers had discovered the Gold Coast and the Congo and the Cape of Good Hope. And just after his discovery Vasco da Gama sailed round the Cape of Good Hope and discovered the sea-route to India, thus entirely altering the course of the World's trade routes, because until then, all commerce from India and China reached Europe through Russia or through Turkey.

With such a sea-faring record as this, the Portuguese people naturally have a magnificent tradition. And that tradition is still maintained in the air. We must remember that the first people to cross the whole of the South Atlantic ocean by air were Admiral Gago Coutinho and Commander Sacadura Cabral, who in 1923 made the voyage in a Fairey float seaplane with a Rolls-Royce engine.

Since then, other Portuguese aviators have made magnificent flights, from Portugal to the Portuguese Colonies in the Far East and from Portugal right across Africa to Portuguese East Africa. The number of these flights has been quite out of proportion to the population of Portugal and to the number of people there engaged in aviation. Which is the best possible proof that the spirit of the old Portuguese adventurers still exists.

Also we should do well to remember what is known to comparatively few people even among the educated classes, that on the authority of the great Duke of Wellington himself the Portuguese contingent which fought alongside our troops in the Peninsula War fought astonishingly well. Also, those who really know all the circumstances of the Portuguese Division which was sent to France in the War 1914-1918, recognise the personal gallantry of the Portuguese fighting men. The real trouble there was simply the lack of experience of the officers and the lack of adequate staff training,—and obviously staff training adequate for a great war cannot be got in a small country with such a small army as that of Portugal.

To the ordinary ignorant Englishman who reads nothing



WHAT IT MEANS TO US.—Lisbon in relation to England and the Oversea Air Lines which we shall have to fly some day.

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except newspapers, Portugal probably appears merely as a little country somewhere down in the left-hand bottom corner of Europe, which is given to having earthquakes and revolutions, and whose King has, unfortunately, lived in exile in this country. These are ideas which we ought to get rid of as quick as possible.

The Possibilities of Portugal.

Portugal is in fact a country of vast possibilities. Nobody knows what its mineral wealth may be. But there is quite good reason to believe that with proper exploitation and subsequent development of the mines, Portugal might prove to have quite as much mineral wealth as that out of which Spain makes so much money.

Apart from that, Portugal grows an immense amount of wine. Most of us think that Port is about the only kind of wine produced in Portugal. As a matter of fact, the bulk of Portuguese wine goes to Bordeaux and is then mixed with French wine and sold to an innocent world as Claret, or other Bordeaux vintages,—much in the same way as vast quantities of Italian wine go to France and are foisted on the world as Burgundy.

Furthermore, a very high percentage of the total amount of cork used in the World, whether for prosaic commercial purposes, such as bath mats or insulating material, or for the more romantic purpose of corking wine bottles, comes from Portugal. And, very properly, seeing that we in this country are about the biggest drinkers per head of population in the World, most of the cork business is in the hands of English people, many of whom have had property and have lived in Portugal for many generations. But, for some strange reason, an American firm, named the Armstrong Cork Co., also has big interests in Portugal,—which seems unnatural for a country which should legally need only glass stoppers for lemonade and balloon-juice generally.

Fruit of all kinds, olives, tomatoes and any kind of vegetable, grow by themselves in Portugal, thanks to a magnificent climate and a very fertile soil when it is properly handled.

The Portuguese People.

The people of Portugal are extremely pleasant. They are in fact, exactly like the Southern Irish,—that is to say, the better sort of Southern Irish. And they have the advantage over the Southern Irish that they are not enervated by the Gulf Stream, but are energised by the clear Atlantic.

The resemblance to the Southern Irish is quite natural because the South of Ireland was populated practically entirely from the Iberian Peninsula, and probably mostly from that part of it which was known in Roman times as Lusitania, and is now known as Portugal. The fact that Northern Ireland was populated by Scandinavians and other Nordic by-products accounts for the fact that North Ireland and the Irish Free State can never possibly work amicably together unless North Ireland governs the rest,—just as the Slavonic Serbs and the Mongoloid Bulgars can never live peacefully side by side.

Among the lower classes of the Portuguese there is a strong admixture of Moorish blood and East Indian blood and pure nigger blood from Africa. This is because for a period the Moors over-ran and governed Portugal, just as they over-ran and governed the whole of Spain, except a little bit in the North-West corner. And it is due to the fact that the Portuguese round-the-World navigators and colonial governors and so forth brought back to Portugal with them slaves and servants of all kinds and of both sexes. Consequently, these various coloured servants became much mixed with the lower classes. But, as this importation has ceased for quite a considerable time, the coloured blood is slowly but surely dying out,—as mongrel blood is bound to die out in course of generations. And there is no actual colour problem, as in the United States.

The upper class of Portuguese are among the most charming people in the World. They are of the same stock as the Spanish nobility. That is to say, basically they are Visigoths. But there are many descendants of Frankish adventurers, or Norman adventurers, who came into the Iberian Peninsula after the Moorish conquest and helped the Visigothic nobility and the remnants of the old Ibero-Roman nobility to push the Moors out.

Also there is in the Portuguese upper classes, a very strong admixture of English, that is to say, Norman-English blood. Portugal rightly claims to be the oldest ally of England,—and there has always been constant communication between Portugal and England. The English Royal Family has supplied several wives to Portuguese Kings and Princes. And likewise the Portuguese Royal Family and nobility have supplied wives to their own class in England.

Possibly because of this intermixing between the English and the Portuguese, and because of the similarity between the Southern Irish and the Portuguese lower classes, Portugal seems much less of a foreign country than does either the South of France or Italy.

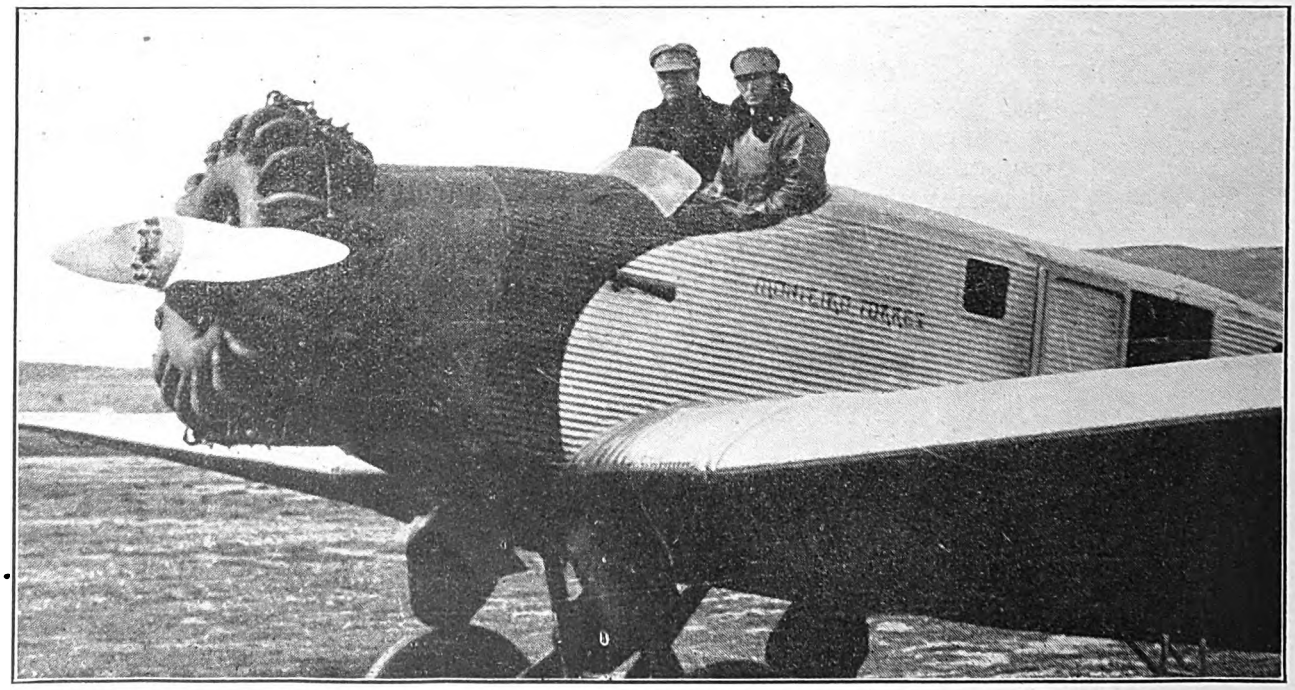
Portuguese Character.

The thing that struck one most about the working people of Portugal, whether the town-dwellers or the agricultural people right out in the country, was their obvious high level of intelligence. You hardly ever see anybody in Portugal who looks stupid. You never see that stolid animal expression which you do among the field-workers of England and Flanders, in particular.

The Portuguese people are hard-working, extraordinarily kindly, and always ready to help the poor ignorant foreigner who does not speak their language. And they are very clean, compared with the agricultural people of some other countries which one has visited. Evidently, with good government and a good system of education there are immense possibilities in the Portuguese people.

The only people one saw who, as a class, seemed objectionable, were the students in Lisbon. But probably that applies equally well to the student class in any country.

Not so many years ago, when in a student rag the venerable Mr. Asquith, as he then was before he was created Lord Oxford, was seriously injured, one of the London even-



THE CHIEF.—Colonel Cifka Duarte (left) and the officer who is to accompany him on his flight to the Azores and possibly to America, in the Junkers (Jupiter engine), photographed at the Military Air Station at Alverca.

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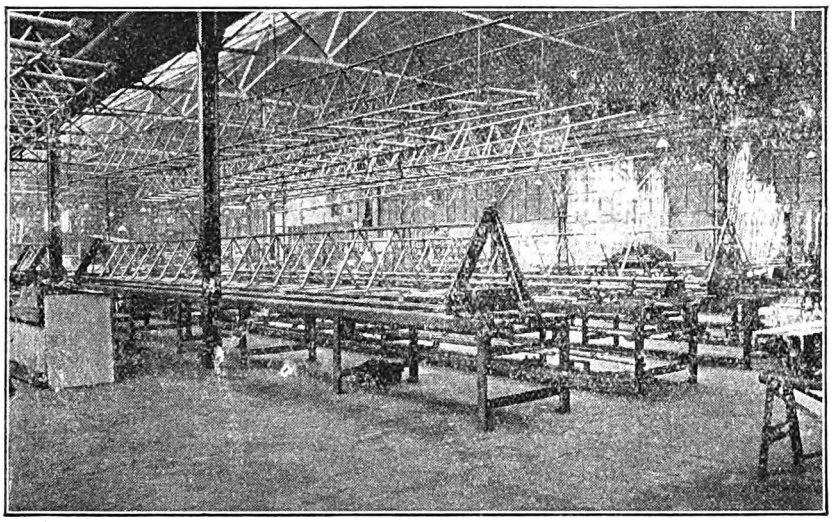
ALL-METAL AIRCRAFT



Without the use of the continuous heat treatment process the longitudinal girders for R.101 shown in this photograph could never have been made.

The Boulton & Paul System of Metal Construction

The process developed by Boulton & Paul Ltd. for the continuous heat treatment of formed steel sections is among the most important of the developments yet made in connection with the construction of metal aircraft.

Increased accuracy of form is secured because the material is worked in the fully annealed state. After forming, the material may be hardened and tempered to any desired physical qualities of which it is capable without risk of distortion. No other process is known by which thin steel sections of almost any length can be heat treated to any required degree without sacrificing accuracy of form and dimensions.

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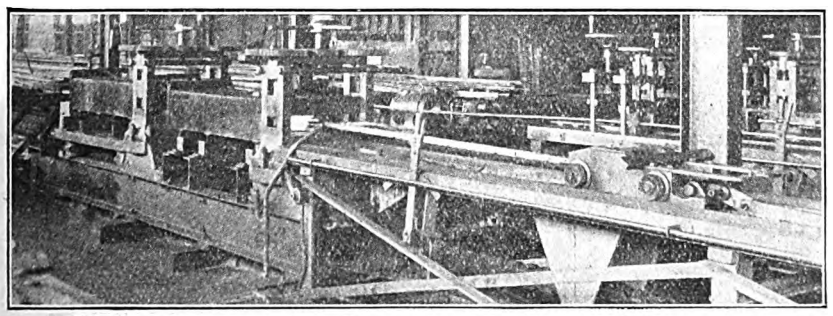

One of the drawbenches and furnaces used in the Boulton and Paul continuous heat treatment process.

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ing papers published without any explanation the simple question, "Why is it necessary to be a cad before becoming a doctor?" Possibly the students who maltreated Mr. Asquith were not actually medical students, but at any rate they belonged to that student class which seems to be equally objectionable all the World over. So one may be doing an injustice to the students of Lisbon.

For the rest of the people, one has nothing but appreciation. In almost any country, for example, if you give a man a tip for looking after a car, he slouches off after he has got it, and that is the last of him. At Setubal, some 25 miles from Lisbon, a local loafer was left in charge of the car while we had lunch. A shower of rain fell and the bright fellow put the hood up. When the shower was over he put it down again. When we went back to the car and he had been duly tipped for looking after it, he tried to be helpful in numerous little ways.

When he found from our conversation that we were not sure of the way out towards the place where we were going, he insisted on coming along with us and showing us exactly the right road. And he might very well have taken himself off with his tip.

When one expressed mild surprise, one was told that this was characteristic of the people. They always want to be kind and helpful and they like being agreeable.

The last so-called revolution, or attempted revolution, is said to have been simply an ordinary outbreak of bolshevism, just like that in this country when we broke the attempted transport strike, and that strike a few years earlier which we nipped in the bud still quicker. The only difference was that in Lisbon a certain number of the troops joined the bolsheviks, and there was some rather ugly shooting up and down the streets. But the total amount of damage done was comparatively small. And anyhow, the story was told entirely wrongly in the English papers, with, naturally, the exception of *The Times*, which in Lisbon, as in every other Capital in the World, is represented by an able man who knows his job and knows the people among whom he lives.

MILITARY AVIATION.

After one had been in Lisbon a few days, one was taken by some friends in the Portuguese Aero Club to be presented to the officer commanding Portuguese Military Aviation. This officer, Colonel Cifka Duarte, who is himself a very able pilot, has undoubtedly brought Portuguese military aviation to an extremely high standard.

Numerous World-flights by Portuguese aviators have given evidence enough of the quality of the individual Portuguese pilot. But that was no proof of the efficiency of their Flying Services as a whole. And in this respect one had a very pleasing surprise.

Knowing a good deal of the way in which Service and civil aircraft are maintained in various European countries, and seeing that Portugal is so many degrees further South, one rather expected the organisation of the Flying Services, and the way in which the aircraft and engines are maintained, to be just that number of degrees worse than further North. Having seen both Service and civil aircraft in some countries with rusty control-wires, ungreased cables, nuts without proper locking arrangements, and various aspects of careless maintenance, one hardly knew quite what to expect in Portugal. Therefore, there was all the more pleasure in discovering that though the Portuguese Army Air Force, and the Naval Air Service, are very small, they are just about as perfectly run as is humanly possible.

Although Portugal is potentially rich, Portugal is a poor country in actual money. Consequently, neither the Army nor the Navy has anything like the amount of money which is needed to build up and maintain Flying Services worthy of the population of Portugal itself—let alone the immense area of its Colonies. But what there is of the Portuguese Flying Services is excellent.

By courtesy of Colonel Cifka Duarte, one's friends were allowed to take one to Headquarters, and the military aerodrome at Alverca. This is a big aerodrome on the banks of the Tagus, about 15 to 18 miles east by north of Lisbon.

Actually the aerodrome itself is ordinary river flat,—probably mostly reclaimed land. But it makes an excellent aerodrome. The only drawback is that the hills start about half a mile inland, and there is not the slightest hope of ever getting a machine down in one piece in a forced landing.

There are a few places where a clever pilot might get down without breaking his machine, but there is certainly nowhere whence he could every fly it out again. Where the hill-sides are not naked rocks, they are covered with olive groves, gardens and so forth. There is nothing even remotely resembling an ordinary open field in that part of the country.

Along the river flat itself all the land except the aerodrome is cut up by ditches in small patches, none of them much bigger than an ordinary tennis court. So there is just as little hope of making a successful forced landing and subsequently of getting away here as there is in the hills. Nevertheless, the Army pilots fly continually, all over the surrounding country, and from Alverca to the other military aerodrome at Amadora, near Sintra, a matter of 20 or 25 miles.

Possibly this lack of hope of ever getting away with a forced landing may help to account for the extraordinary care with which the machines and their engines are maintained. But quite as much of that care is obviously due to the fact that the men in charge of the maintenance of the machines are artisans who love their work.

(*To be continued.*)

CIVIL AIRCRAFT.

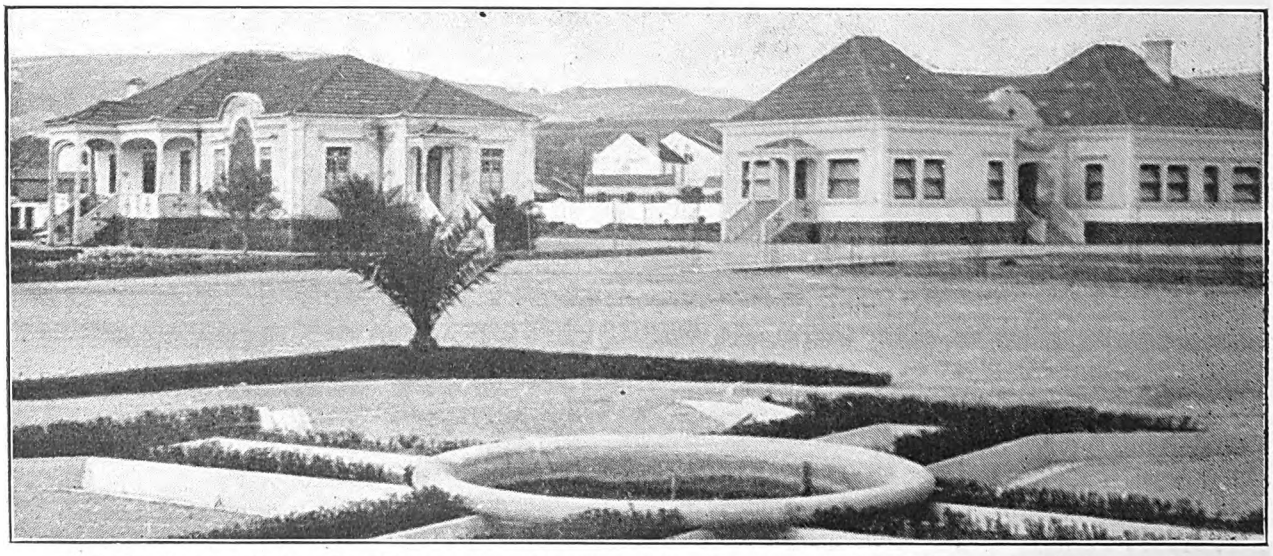
In the House of Commons on Mar. 25, in reply to a question by Mr. Day, the Under-Secretary of State for Air said that the number of civil aircraft registered in Great Britain and Northern Ireland on Feb. 28 last was 646; of these 443 held current certificates of airworthiness.

THE NEXT ZEPPELIN VOYAGE.

The *Graf Zeppelin* is to start in May for Sevilla, whence she is to cross the South Atlantic by way of the Canaries to Pernambuco and Rio de Janeiro. She is to stay three days at the mooring mast at Pernambuco and to go thence to Habana, Cuba, and so to Lakehurst. She will return from America by way of Spain. The passenger fare for the round trip is $6,000.

THE LONDON AEROPLANE CLUB RAFFLE.

The winner of the D.H. Gipsy-Moth, Lieut. H. G. Craig, R.N., has very generously given the London Aeroplane Club the opportunity of acquiring the machine at a very substantial reduction in price. This offer the Club has gladly accepted.



AT HEADQUARTERS.—The Officers' Mess (right) and the Hospital at the Military Air Station at Alverca.

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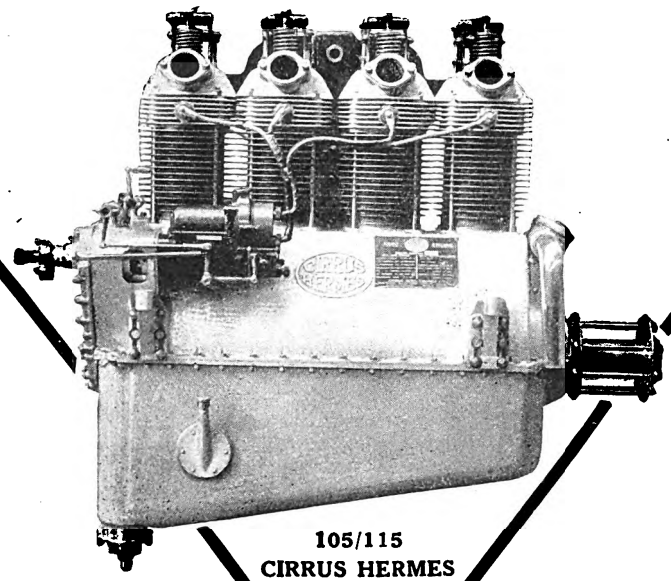
NOTABLE HERMES FLIGHTS



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A NEW AVIATION FIRM IN PORTUGAL.

This information, read in conjunction with our leading article this week, is of interest:—

On Mar. 11, 1930, there was registered, according to the law of the land, a new aviation undertaking known as the *Companhia Portugueza de Aviacao* (The Portuguese Aviation Company), with a registered capital of Esc.20,000,000 (roughly £200,000), divided into 20,000 shares of Esc.1,000 each, i.e., 15,000 ordinary and 5,000 preference.

These shares will be offered for sale in the Lisbon and Oporto Stock Exchanges, and preference will be given to Portuguese subjects.

The following entities have undertaken to take up at once shares as follows:—

Sociedade Portuguese de Estudos e Linhas Aereas Ltda.	1,400
Ayres Ferreira de Sousa	50
Artur Ribeiro Lopes	50
Celestino de Pais Ramos	50
Diogo Joaquim de Matos	50
Luis de Almeida Couceiro	50
Luis Pereira	50
Jose Schmidt Rau	50
Manuel da Costa Vasques	50

The Head Office of the Company will be, provisionally, Rua do Alecrim, 33, 2nd Floor, Lisbon.

The Company was formed owing to the acceptance by the S.P.E.L.A. of the conditions imposed by the Government, one of which was that the Company should be Portuguese. This means that another big step has been taken towards getting Portuguese aviation into the hands of the French.

The objects of the new Company are:—

(1) The exploitation of public or private, regular or irregular, transport services by aircraft of persons, goods, animals and correspondence, not only within the limits of Portuguese territory, including the adjacent islands, but also between any point in this territory and foreign countries and eventually in foreign countries: as also the study, purchase and construction of aircraft and aircraft material.

(2) Exploitation of aerodromes and all subsidiary services.

(3) Exploitation of all subsidiary services, such as photography, map-making, publicity, etc.

It is also permitted to carry out any financial operations which may be deemed necessary, directly or indirectly, to the attaining of its objects.

Alterations in capital are permitted, but while the concession lasts it may not be more than Esc.25,000.000 nor less than Esc.20,000,000.

THE NEXT ATTEMPT.

The Duchess of Bedford, Mr. C. D. Barnard and Mr. B. Little are nearly ready for their next big flight in *The Spider*, Her Grace's Fokker F.VII (Bristol Jupiter). The scheme is to fly to the Cape in ten days and come back in nine. The quickest flight to the Cape so far was that of Lieut. P. Murdoch, S.A.A.F., who flew an Avro Avian (80 h.p. Cirrus II engine) to the Cape in fifteen days, from July 29 to Aug. 12, 1928.

The previous big flight of the Duchess, which is now a classic, was her trip to India and back in eight days between Aug. 2 and Aug. 10, 1929. She was accompanied by Mr. Barnard and Mr. Little, in the same machine.

MORE RECORDS TO BE BEATEN.

On Feb. 12 Mr. W. G. Moore in an Inland Sport monoplane (Warner Scarab engine) averaged 126.95 m.p.h. over a 100 km. course at Kansas City, and thus claims to have beaten the World's record for two-seat light aircraft weighing less than 880 lbs., at present held by Mr. Alan Butler in a Gipsy Moth at 119.839 m.p.h.

Mr. Moore made a previous attempt to break this record late last year when he made an average speed of 123.17 m.p.h., carrying the equivalent weight of a passenger as ballast. The second time he carried a real live passenger.

On Feb. 18 Mr. Lee Schoenhair, flying a Lockheed Vega monoplane (Pratt and Whitney Wasp), at Jacksonville, Florida, averaged 185.452 and 171.228 m.p.h. over 100 kms. and 500 kms. respectively, carrying a useful load of 500 kgs. (1,100 lbs.).

On Feb. 20 the same pilot on the same machine at the same place, averaged 175.997 and 168.114 m.p.h. over 100 kms. and 500 kms. respectively carrying 1,000 kgs. (2,200 lbs.) of useful load.

Three of these performances beat the existing International Records at present held by Mr. Hubert Broad with the D.H. Hound. These are the speed of 158.656 m.p.h. over 500 kms. carrying 500 kgs. (1,100 lbs.), and the speeds of 160.28 m.p.h. and 168.656 m.p.h. over 100 kms. and 500 kms. carrying 1,000 kgs. (2,200 lbs.) of useful load.

A FESTIVE OCCASION.

On April 1 a Caproni machine at the Ciampino aerodrome near Rome took off and aerobatted all over the aerodrome. Ultimately it crashed and then caught fire. The ambulances and fire brigade rushed to the wreck and could find no trace of a pilot. Various reports state that the mechanic who was running up the engine accidentally opened the throttle and was unable to check the machine. On the other hand the aircraft may have had a look at the calendar and have decided to play a grim practical joke.

ZANZIBAR.

On Apr. 7 Mr. Campbell Black landed an aeroplane of Wilson Airways Ltd. on Zanzibar Island. This is alleged to be the first time the feat has been done. During the War 1914-18 a detachment of R.N.A.S. were operating in the neighbourhood, so aircraft, even if only on floats, have been seen from the Island before.

On the other hand Wilson Airways Ltd. and in particular Mr. Campbell Black have been doing an immense amount to develop aviation in Kenya and the neighbouring parts of Africa. So this is quite an event as demonstrating the fact that Zanzibar can be linked up by air with the main air routes on the African Continent.

THE ADVANTAGE OF FLOATS

On April 1 (*absit omen*) a Stinson monoplane (300 h.p. Wright Whirlwind) on floats left New York for Bermuda. The machine carried fuel for a voyage of nine or ten hours; Mr. William Alexander was the pilot, Mr. Lewis Yancey was the navigator, and Mr. Bouch, the owner of the machine, was the wireless operator. Mr. Yancey was the navigator of the *Pathfinder*, a Bellanca monoplane which flew from Old Orchard, Maine, to Santander last year.

At sunset the machine alighted on the sea, which was calm, some 60 miles to the north of the island. The crew broadcast a wireless message in which they stated they proposed to taxi to Bermuda in the morning. In spite of this the steamer *Lady Somers*, from Bermuda to Halifax, was instructed to look for the machine and finally found it.

The crew reported all well and at daybreak on April 2 took-off for the last sixty miles. Shortage of fuel forced them to alight again. The machine was refuelled on the water from motor-boats and then took off once again for Bermuda, which was successfully reached.

The distance was about 800 miles, so the flight was not remarkable as a long-distance effort. The Atlantic has been flown by a Fokker with floats, but Bermuda is a very small island in a very large sea. The total area of the islands is only about 20 square miles, so that careful navigation is required.

The flight has demonstrated that trans-oceanic attempts should be made in seaworthy machines and also, as the recent forced landing of Mr. Smith and Lieut. Shiers has shown, that a radio transmitter should be carried by the machine, which can be operated when the machine has alighted.

IMPORTANT DATES.

April 12.—N.F.S. Meeting at Hull.
April 12.—Re-Union Dinner of No. 46 Squadron.
April 16.—Boxing, R.A.F. Team Championships.
April 17.—Spring Session at Cranwell ends.
April 19.—Leicester Flying Meeting (Leicestershire Aero Club) (with R.A.F. support).
April 20.—Zeebrugge (1918) Association Church Service.
April 21, Easter Monday.—Meeting at Hanworth.
April 22.—Re-Union Dinner of Zeebrugge (1918) Association.
April 26.—N.F.S. Meeting at Leeds.
April 26.—No. 45 Squadron Re-Union Dinner.
May 5.—R.A.F. Staff College, Second Term begins.
May 29.—Royal Tournament at Olympia opens.
May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support).
June 7.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—R.A.F. Garden Party at Manston.
June 15.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gwynn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
July 3.—Indian Empire Garden Party at Hurlingham.
July 5.—King's Cup Air Race (Royal Aero Club—Heston Air Park).
July 13.—N.F.S. Meeting at Leeds.
July 19.—N.F.S. Meeting at Hull.
July 20—Aug. 7.—International Touring Competition.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

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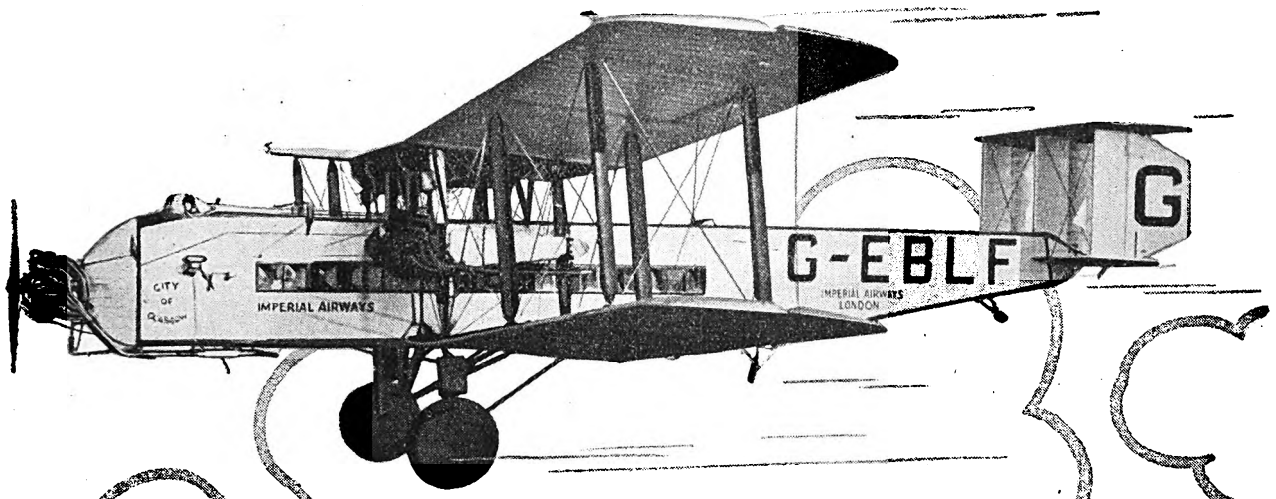

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AERO ENGINES

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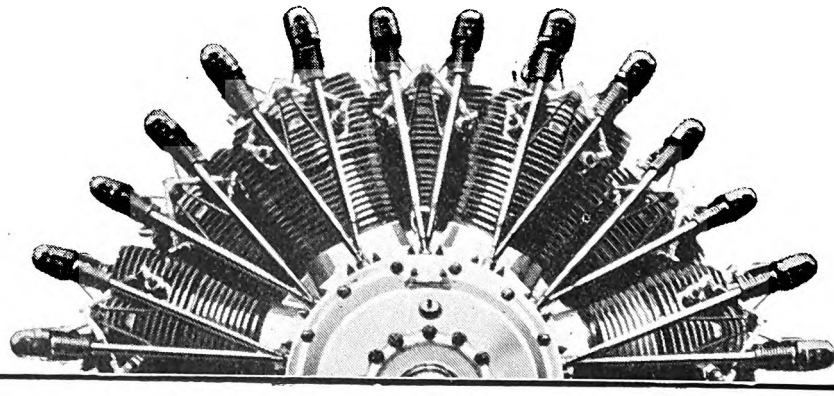

AUSTRALIA uses Genet, Genet Major, Mongoose, Lynx, Jaguar.
NEW ZEALAND uses Jaguar.
CANADA uses Genet, Genet Major, Lynx, Mongoose, Jaguar.
SOUTH AFRICA uses Genet, Genet Major, Lynx, Jaguar.
INDIA uses Jaguar, Genet Major.
EGYPT uses Jaguar, Genet Major.
FRANCE uses Genet, Genet Major, Lynx.
GERMANY uses Genet, Lynx, Jaguar.
BELGIUM uses Lynx.
SPAIN uses Lynx.
HOLLAND uses Mongoose, Lynx, Jaguar.
SWEDEN uses Mongoose, Lynx, Jaguar, Leopard.
AMERICA uses Genet, Genet Major, Jaguar.
ARGENTINE uses Mongoose.
BRAZIL uses Lynx.
CHILE uses Lynx.
LATVIA uses Lynx, Jaguar.
ESTHONIA uses Genet Major, Lynx.
JAPAN uses Mongoose, Lynx, Jaguar, Leopard.
DUTCH EAST INDIES uses Lynx.
IRAQ uses Jaguar.
MALTA uses Jaguar.
DENMARK uses Lynx Jaguar.
ITALY uses Lynx.
RUSSIA uses Jaguar.
POLAND uses Genet.
GREECE uses Lynx, Jaguar.
SWITZERLAND uses Lynx.
ROUMANIA uses Jaguar.
IRELAND uses Genet.
SIAM uses Lynx.
SINGAPORE uses Genet Major.

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KNOWN AND FLOWN ALL OVER THE WORLD.

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, April 1.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—The following Plt. Offs. on probation are confirmed in rank:—G. S. King (Feb. 11); E. D. Bishop, A. F. C. Booth, R. C. A. Brooke-Beer, E. A. Cooke, C. S. Gill, F. R. W. Goad, L. E. Jarman, V. R. Moon, G. E. Mustard, G. N. Roberts, H. L. Smith, D. W. Smythe, T. H. Wilson (Feb. 22); G. F. Alexander, S. J. H. Carr, R. P. Cauthery, R. H. Cave Penney, H. M. B. Collins, C. E. Hartley, P. B. Lusk, C. S. Millar, H. B. Robertson (April 2).

The following Plt. Offs. are promoted to the rank of Flg. Off.:—D. J. Hughes-Morgan (July 9, 1929); A. G. Adnams, B. A. Blythe, A. E. Louks (Mar. 14).

Flg. Off. F. W. Wrench takes rank and precedence as if his appointment as Flg. Off. bore date Oct. 25, 1921. Reduction takes effect from Mar. 8, 1930; Group Capt. E. M. Murray, D.S.O., M.C., is placed on the half-pay list, scale A, Mar. 1 to 28, inclusive.

The following are placed on the retired list at their own request:—Wing Cdr. J. N. Fletcher, A.F.C. (Mar. 31); Flg. Off. F. T. Jacobs (April 1).

The following are transferred to the Reserve, class A:—FLT. LT.—H. J. Gearing (April 1). FLG. OFFS.—M. Brunton, F. W. Field, F. H. Hannaford, G. J. C. Mahony, V. C. Taylor (Mar. 31); P. G. Tweedie (April 1).

Capt. B. W. Knowles, R.M., Flg. Off., R.A.F., relinquishes his temp. comn. on return to duty with the Royal Marines (Feb. 10); Capt. H. M. A. Day, A.M., R.M., Flt. Lt., R.A.F., relinquishes his temp. comn. on return to duty with the Royal Marines (Mar. 31); Lt. R. H. Langton, R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on retirement from the Royal Navy (Mar. 18).

STORES BRANCH.—Wing Cdr. E. J. Sayer, M.C., is placed on the retired list (Mar. 27); Flt. Lt. J. G. Smithson is placed on the retired list at his own request (Mar. 31).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—A. C. C. Seligman, A. J. C. Stuart (Mar. 17); C. E. G. Mumby (Mar. 18); O. P. E. Reed, P. R. Q. Henriques (Mar. 19); J. O. Hinks, A. J. Fedden (Mar. 20). G. J. W. Oddie is granted a comn. in Class B.B. as a Plt. Off. on probation (April 1); A. M. Carey is granted a comn. in the Special Reserve as a Plt. Off. on probation (Mar. 8); Flg. Off. on probation C. R. Robbins, M.C., D.F.C., is confirmed in rank (Mar. 20); Flg. Off. E. G. D. Stewart, M.C., is transferred from Class A to Class C (Mar. 5); Flg. Off. E. D. Cummings, D.F.C., is transferred from Class C to Class A (Mar. 19). The notification in the *Gazette* dated Nov. 26, 1929, concerning Flg. Off. C. McL. Reid is cancelled.

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 600 (CITY OF LONDON) (BOMBER) SQUADRON.—The following to be Plt. Off.:—G. E. Villiers (Mar. 17).

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—The following to be Plt. Off.:—E. S. Lambert (Jan. 13).

Flg. Off. J. A. Edwards resigns his comn. (Mar. 3).

Appointments.

Week ending April 7.

GENERAL DUTIES BRANCH.—Group Captain H. L. Reilly, D.S.O., to R.A.F. Depot, Uxbridge; attending Senior Officers' War Course at the R.N. War College, Greenwich, 17/3.

Wing Commanders J. S. T. Bradley, O.B.E., to Station H.Q., Northolt, to command, 17/3. G. H. Elliott-Smith, A.F.C., to Armoured Car Wing, 'Iraq, to command, 22/2.

Squadron Leaders D. E. Stodart, D.S.O., D.F.C., to H.Q., 'Iraq Command, 26/2. B. McEntegart, to C.F.S., Wittering, 24/3.

Flight Lieutenants C. W. Busk, M.C., A.F.C., to Practice Camp, Sutton Bridge, 8/3. G. H. Vasse, to Practice Camp, North Coates Fitties, 8/3. W. Wynter-Morgan, M.C., to Practice Camp, Catfoss, 8/3. J. R. D. Goadsby, to Station H.Q., Tangmere, 17/3. M. C. W. C. Flint, M.C., to No. 70 Sqdn., 'Iraq, 24/2. G. D. Middleton, to R.A.F. Base, Malta, 5/3. C. H. A. Stevens, to Air Ministry (D.O.S.D.), 7/3.

Flying Officers P. J. H. Halahan, to No. 35 Sqdn., Bircham Newton, 11/3. H. V. Crowder, to R.A.F. Depot, Uxbridge, 3/3. G. I. L. Saye, to No. 209 Sqdn., Mount Batten, 17/3. M. G. R. Harris, to No. 58 Sqdn., Worthy Down, 17/3. F. P. Donovan, to No. 1 F.T.S., Netheravon, 17/3. D. M. Rees, M.B.E., to Practice Camp, North Coates Fitties, 12/3. N. S. Allinson, to Practice Camp, North Coates Fitties, 8/3. D. J. R. Hylton, to Practice Camp, Catfoss, 8/3. D. M. Harrison, to Practice Camp, Catfoss, 22/2. C. H. R. Little, to Practice Camp, Sutton Bridge, 8/3.

Pilot Officers C. M. Rees, B. J. Hurren and C. R. Lousada, to No. 2 Sqdn., Manston, 4/3. D. H. F. Barnett, H. B. Collins and G. B. Keily, to No. 13 Sqdn., Netheravon, 4/3. H. L. Messiter and H. A. Shotter, to No. 16 Sqdn., Old Sarum, 4/3. R. C. Dawkins, C. V. Ogden and J. S. D. Miles, to No. 26 Sqdn., Catterick, 4/3. G. J. Pawson, to No. 17 Sqdn., Upavon, 4/3. A. J. Tunnard, to No. 23 Sqdn., Kenley, 4/3. F. Lemon and E. A. H. Tanner, to No. 29 Sqdn., North Weald, 4/3. G. C. Holland, V. C. F. Streatfeild and J. D. Baker-Carr, to No. 32 Sqdn., Kenley, 4/3. R. F. Fletcher, to No. 43 Sqdn., Tangmere, 4/3. D. R. C. B. de Sarigny, to No. 54 Sqdn., North Weald, 4/3. M. P. O'Reilly, to No. 111 Sqdn., Hornchurch 4/3.

MEDICAL BRANCH.—Squadron Leaders D. G. Boddie, to Air Ministry (D.M.S.), 19/3. W. E. Hodgins, to H.Q., Coastal Area, 19/3.

Flying Officer W. J. Cotter, to Station H.Q., Worthy Down, 12/3.

STORES BRANCH.—Flight Lieutenant C. J. Polden, to No. 21 Group H.Q., West Drayton, 1/4.

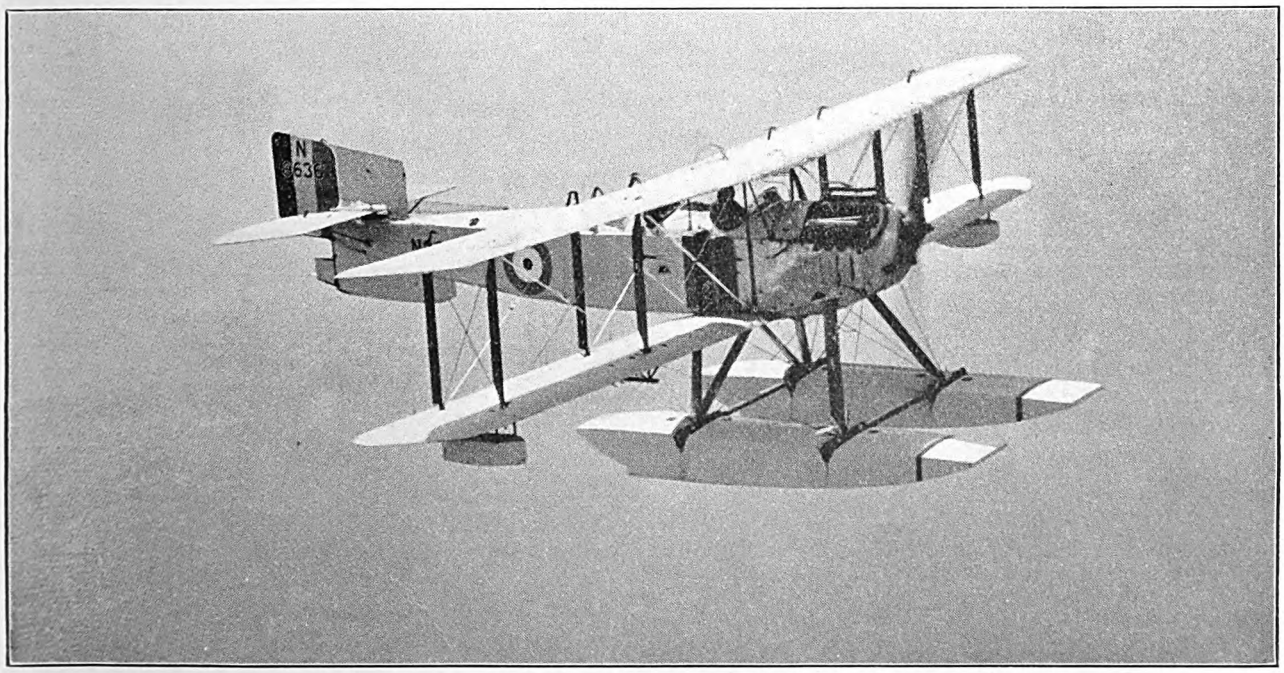
H.R.H. the Prince of Wales.

His Royal Highness the Prince of Wales, K.G., has arranged to fly from the Lotti District on the Uganda Border to Juba on the Upper Nile in a Service Fairey III.F of No. 47 (Bomber) Squadron, R.A.F. The pilot will be Flt. Lt. W. A. B. Bowen-Buscarlet.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Cranwell to a D.H.9a machine of the Royal Air Force College, Cranwell, on April 1, 1930, Flight Cadet William Henry Hodgkinson, the pilot and sole occupant of the aircraft, was killed.

The Air Ministry regrets to announce that 335633 Sjt. John Martin died in hospital on Apr. 6, as the result of an accident at Farnborough to a Grebe machine of No. 23 (Fighter) Squadron, Kenley, on Mar. 17. (Flt. Lt. R. L. R. Atcherley, the pilot of the aircraft, was slightly injured in the same accident.)



LAWFUL OCCASIONS.—A Fairey III.D on floats (Napier Lion) on patrol from Malta. This type has been replaced in most Fleet Spotter Reconnaissance Flights by Fairey III.Fs.

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The Cost of Overseas Squadrons.

In the House of Commons on April 1, in reply to a question by Sir A. Knox, the Under-Secretary of State for Air said that the annual cost of Squadrons in Egypt and 'Iraq varied considerably with their location, the type of aircraft with which they were equipped and the character and extent of the duties on which they were employed. Any very precise figure was impossible, but as a rough estimate based on the maintenance cost of squadrons equipped with a standard type of single-engine bombing aircraft, the annual cost might be stated as about £120,000 in 'Iraq and £110,000 in Egypt.

The Latest Aircraft Carrier.

Extensive trials were made on Mar. 24 at Rothesay of the new aircraft-carrier, H.M.S. *Glorious*. She is said to have attained a speed of thirty-five knots. If this is correct she is, with the exception of destroyers, the fastest warship in the World, as the speed record for capital ships is held by H.M.S. *Hood*, which made 32.07 knots on her trials.

The American aircraft-carrier, *Lexington*, is known to have steamed at 34½ knots.

[Among those who know, the *Glorious* is reputed to have gone to America *and back*, taking Mr. Balfour to Washington in 1918, in less than eight days.—C. G. G.]

H.M.S. *Glorious* returned to Portsmouth on Mar. 30 on completion of her trials and will be at Devonport from April 9 to April 25. She will replace H.M.S. *Courageous* in the Mediterranean Fleet at the end of June.

The Fleet Air Arm complement in H.M.S. *Glorious* will consist of seven Flights, two of which, No. 406 (Fleet Fighter) Flight (Flycatchers), and No. 408 (Fleet Fighter) Flight (Flycatchers), have already embarked. The other Flights will be No. 405 (Fleet Fighter) Flight (Flycatchers) from H.M.S. *Furious*, No. 441 (Fleet Spotter Reconnaissance) Flight (Fairey III.Fs) from H.M.S. *Argus*, No. 447 (Fleet Spotter Reconnaissance) Flight (Fairey III.Fs) from H.M.S. *Furious*, No. 461 (Fleet Torpedo Bomber) (Darts) from H.M.S. *Furious*, and No. 462 (Fleet Torpedo Bomber) Flight (Ripons) from H.M.S. *Furious*.

The Schneider Trophy.

In the House of Commons on April 2, in reply to Capt. Balfour, the Under-Secretary of State for Air said that his statement on the Air Estimates in regard to the Schneider Trophy had been intended to apply to the proposal that the Air Ministry should undertake the construction and loan of new machines, expenditure on which was not considered justifiable in the present circumstances.

When the current programme of experimental high-speed flying was completed, the Secretary of State for Air would be prepared to consider sympathetically any proposals which might be put forward for lending the machines which were already in existence, provided that the cost of any necessary modifications to them was borne by private enterprise, in accordance with the declared policy of His Majesty's Government.

The R.A.F. and Speed Records.

In the House of Commons on April 2, in reply to a question by Mr. Mander, the Under-Secretary of State for Air said that no further attempts on the World speed record were at present contemplated and that the high-speed aircraft in the R.A.F. were being used for research purposes.

Permanent and Medium Service Commissions.

The following short-service officers of the General Duties Branch have been selected for permanent commissions (subject to physical fitness):—

Flight Lieutenants:—J. N. D. Anderson (Lt., R.A., R.A.R.O.), A. W. Bates, I. E. Brodie, F. P. Smythies, G. C. Stemp (Lt., The Buffs, R.A.R.O.).

The following short-service officers of the General Duties Branch have been selected for Medium Service Commissions (subject to physical fitness). The dates against the names of these officers are those on which they enter into medium service:—

Flight Lieutenants:—H. R. B. Howell, F. G. Jennings, H. E. E. Weblin (April 3, 1930).

Flying Officers:—P. E. Berryman (July 7, 1930), J. S. Blomfield (Mar. 14, 1930), E. J. George (July 18, 1930), F. W. H. Hall (July 18, 1930), R. E. Hall (Sept. 28, 1930), D. J. Harrison (Sept. 30, 1930), A. J. L. Hughes (July 13, 1930), D. S. E. Vines (Mar. 14, 1930).

George Again.

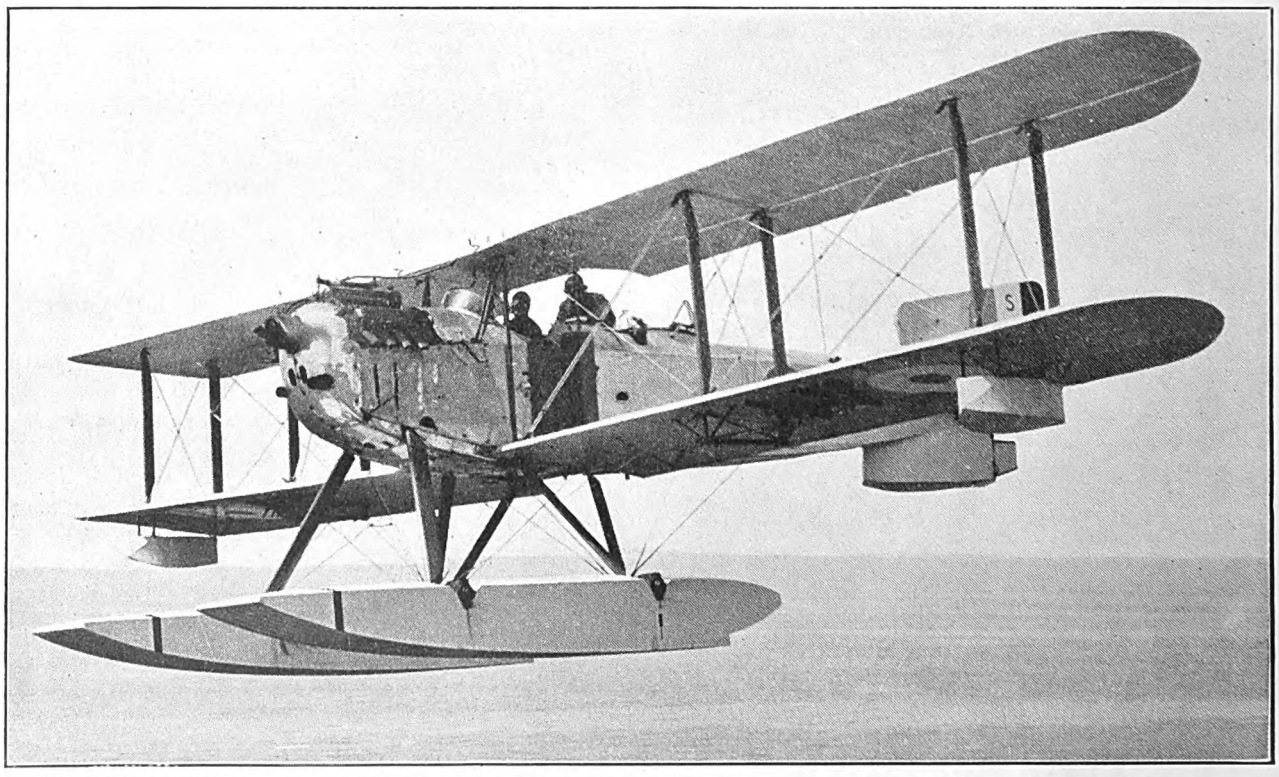
George, the R.A.F. Robot Pilot, officially known as the Pilot's Assister, is in the limelight again. George originally sprang into fame as the result of a casual reference to his activities in The Aeroplane of November 13, 1929.

Shortly after this the Air Ministry issued a statement about the Pilot's Assister, a form of automatic gyroscopic control for aircraft which had been successfully tested on several types of Service aircraft.

There is no foundation for the statement which appeared last week in several morning newspapers that a Squadron of the R.A.F. had flown 400 miles in formation with each machine automatically controlled. The original Air Ministry statement referred to one trip of 400 miles made by one machine controlled by the Pilot's Assister. The recent newspaper excitement is therefore partly untrue and partly news which is six months old.

The R.A.F. and the Flying Clubs.

In the House of Common on April 2, in reply to Mr. Mander, the Under-Secretary of State for Air said that the light aeroplane clubs already served a very useful purpose in training possible candidates for entry into the Reserve of Air Force Officers and the Auxiliary Air Force. The standard of knowledge demanded of regular officers of the



POST-TRAFALGAR.—A worthy veteran of not-so-very-recent type, still used by the Fleet Air Arm, flying over the Mediterranean. (A Fairey III.D.—Napier Lion.)

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ESTHONIA ADOPTS THE "Bristol" BULLDOG.

ON FOUR CONTINENTS THE "BRISTOL" BULLDOG IS IN SERVICE TO-DAY.

The Esthonian Government have placed an order with the Bristol Aeroplane Co., Ltd., for the supply of "Bristol" Bulldog single-seater fighters.

The order was obtained in the face of keen competition from manufacturers all over Europe, but Esthonia, following the example of Great Britain, Latvia, Australia and other countries in which Bulldogs are in service, decided in favour of the Bulldog.

This choice was dictated not only by reason of the outstanding performance of the Bulldog, but also because of the excellence of its design and all-steel construction, its great strength, and its ease of maintenance and upkeep.

Designed and Manufactured by
THE BRISTOL AEROPLANE CO., LTD.,
FILTON [illegible] BRISTOL.
'Phone : 3906 Bristol. 'Grams : "Aviation, Bristol."

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R.A.F. was, however, much higher than that which the clubs could reasonably hope to attain. In order to train up to that standard, which included much more than the ability to fly, the clubs would need to provide themselves with aircraft of varying types and other equipment on the same scale as the flying training schools of the R.A.F., and would require a staff of specialised instructors in tactics, armament, and the other technical subjects studied in the Service.

[Incredible though it may seem, there are quite a number of officials and members of flying clubs who think and preach that Service training could be done at flying clubs. Perhaps Mr. Montague's reply will serve to disillusion them.—Ed.]

An Admiralty Appointment.

Captain Charles E. Turle, D.S.O., R.N., was appointed Director of the Naval Air Division, Admiralty, on April 5, 1930, in succession to Captain I. W. Gibson, O.B.E., M.V.O.

Captain Turle has just completed the Senior Officers' War course.

Team Championship Boxing.

An excellent programme was staged at Henlow on April 1 when Henlow met Manston in the Final of the R.A.F. Team Championships. Henlow won by 18 points to 12.

Sir Percy Cox, Air Marshal Sir Edward Ellington, Air Vice-Marshal A. E. Borton, and Group Capt. A. V. Bettington occupied seats at the ringside.

Officers' Heavy-weight.—Flt. Lt. G. R. Beamish (Henlow) w.o. Flg. Off. Iremonger (Manston).

Officers' Middle-weight.—Flg. Off. D. McLean (Henlow) beat Flg. Off. Humphries (Manston). McLean was easily superior from the outset. In the second round Humphries went to the boards three times, and the referee stopped the fight in McLean's favour.

Officers' Light-weight.—Flg. Off. V. Matvieff (Henlow) outpointed Flg. Off Wicks (Manston).

Airmen's Bantam-weight.—AC. H. Johnson (Manston) beat L-AC. Williamson (Henlow) on points. Williamson scored to the body in spells of in-fighting during the second round, but Johnson landed heavily with right and left swings to the head during the final round and covered well from Williamson's straight lefts.

Airmen's Feather-weight.—Sjt. Davison (Manston) outpointed AC. Cameron (Henlow). Davison exhibited a useful left lead and was easily the more experienced fighter. Cameron did extremely well to last the three rounds.

Airmen's Light-weight.—AC. Lloyd (Henlow) beat AC. Smethurst (Manston) on points. In the second round Lloyd floored his opponent with a left to the point, and again in the final round with a left swing to the mark, winning comfortably on points.

Airmen's Welter-weight.—Sjt. Harper (Henlow) outpointed L-AC. Garrett (Manston).

Airmen's Middle-weight.—Cpl. Woods (Henlow) beat AC. Nee (Manston) on points.

Airmen's Light-Heavy-weight.—L-AC. Miller (Henlow) beat L-AC. Harrison (Manston) on points. In the second round Harrison landed heavily with rights to the head, but could not keep out Miller, who scored freely.

Airmen's Heavy-weight.—AC. Watts (Henlow) outpointed L-AC. Dean (Manston). Watts held a decided advantage throughout the three rounds, maintaining an excellent guard and scoring with lightning lefts. Dean did extremely well to avoid a knock-out.

The Cup and Shields were presented by Sir Percy Cox (late High Commissioner for 'Iraq), who said: "It is a very great honour and privilege to be here to-night. This is the third occasion you have been good enough to invite me to meetings of your Boxing Association, and it is an unalloyed pleasure. I was formerly very much associated with the R.A.F. and my coming here not only gives me an opportunity of seeing an excellent and clean display of Boxing, but also of seeing old friends in the Air Force I have not seen for some time. The honour is on my side and it is with very great pleasure I present the prizes to-night."—C. H. H.

The R.A.F. Swimming Association.

Units affiliated to the R.A.F. Swimming Association are reminded that their annual subscriptions should be paid before May 1, 1930.

The result of the Swimming Certificate Competition for the season 1929 is as follows:—

R.A.F. Base, Calafrana (strength during period May to September 1929—288): Certificates issued including requalification—274. Percentage obtained—95.1.

No. 8 Squadron, Aden (strength during period May to September 1929—158): Certificates issued including requalification—136. Percentage obtained—86.2.

Headquarters, R.A.F., Aden (strength during period May to September, 1929—43): Certificates issued including requalification—34. Percentage obtained—79.0.

The R.A.F. Lawn Tennis Association

The annual general meeting of the R.A.F. Lawn Tennis Association will be held at the Air Ministry, Room 374, on May 2, 1930, at 15.00 hours.

In order to ensure general attendance at the meeting Commanding Officers are particularly requested to appoint one representative from each station to attend, for whom travelling expenses will be admissible.

Officials and a championship committee will be elected and the date and venue of the championship meeting of 1930 will be considered.

No. 55 Squadron Re-Union Dinner.

The Twelfth Annual Re-Union Dinner of No. 55 Squadron, R.F.C. and R.A.F., was held at the Park Lane Hotel on April 5.

It was attended by the following former officers and by four Guests:—

Group Capt. J. E. A. Baldwin, D.S.O., O.B.E., Squadron Leaders W. B. Farrington, D.S.O., G. W. B. Grigson, D.S.O., D.F.C., C. A. Stevens, M.C., Flight Lieutenants A. Silvester, G. W. Hayes, H. S. Walmsley, Flying Officer C. B. Feasey, Messrs. J. S. Bradley, S. B. Collett, W. H. M. Groom, R. Hood, A. Lindley, J. A. D. Wallis, C. H. Sands, and L. B. Goodyer (Hon. Sec.).

Telegrams were received from two former Observers now in Vancouver and from Wing Commander A. Gray now in Simla. A telegram was also received from No. 55 Squadron now stationed at Hinaidi, 'Iraq, and commanded by Sq. Ldr. J. W. Woodhouse.

The Women's Royal Air Force Re-Union.

The Seventh Annual Re-Union Dinner of the Women's Royal Air Force Old Comrades' Association was held at the Comedy Restaurant, Panton Street, W.1, on April 5.

Dame Helen Gwynne-Vaughan, D.B.E., President of the Association and formerly Commandant of the W.R.A.F., was in the Chair. The Guests of Honour included Air Marshal Sir Edward Ellington, Air Officer Commanding-in-Chief, Air Defence of Great Britain; Group Captain L. W. B. Rees, V.C.; Major Cohen, M.P., Hon. Treasurer of the British Legion; Sq. Ldr. A. H. Wann; Miss Cruickshank, C.B.E., Matron-in-Chief, Princess Mary's R.A.F. Nursing Service; and Representatives of the R.A.F. Memorial Fund and of the Old Comrades' Association of Q.M.A.A.C. and the W.R.N.S.

About 120 former members of the W.R.A.F. were present.

After the toast of the King had been honoured, Mrs. Powell proposed "The Guests." After quoting the ancient proverb, "Let thy speech be better than silence or be silent," she said how honoured the company was to have such distinguished Guests. She described, in a few words, the deeds for which Group Capt. Rees was awarded the Victoria Cross. She then welcomed each of the other Guests in turn and her remarks were greeted with rounds of applause, which one hopes to a small extent compensated those of the men guests who found themselves facing such fearful odds.

Replying for the Guests, Group Capt. Rees said that since the end of the War the Royal Air Force had had to work so much harder that they had not had so many opportunities of meeting their friends. It was very good to be with so many friends who had worked with them, wing-tip to wing-tip during the War. It was a new experience for the men present to have their health drunk by the ladies. As a rule the tyre was on the other wheel. If this was a revolution, long might it go on.

When the Royal Air Force had come home after the War it had been a great relief to Commanding Officers to find the W.R.A.F. there, willing and able to do the work. He personally had found that the men and women of the R.A.F. were cast in much the same mould, except that some men were mouldier than others.

Marching was still considered one of the outward and visible signs of drill and discipline in the Service and everybody had always been impressed by the marching of the W.R.A.F. Making a speech in the present company made him feel rather like Lady Godiva on her ride from Coventry—thank goodness he was getting near his close. He thanked the company for the way in which they had received the toast of the Guests.

Dame Helen Gwynne-Vaughan, proposing "The Royal Air Force," coupled with the name of Air Marshal Sir Edward Ellington, began by reading out the telegrams and messages she had received from Old Comrades all over the World who were unable to be present. She went on to say that certain former members of the Force had written to her in doubt about joining the Old Comrades' Association because they were members of the League of Nations. She asked those present, if they met anyone with this unhappy point of view, to tell them that the O.C.A. was not an organisation for the promotion of War. The last thing the W.R.A.F.'s wanted was War, but there were worse things than War. Nobody wanted to die, but there were worse things than death. A country that had not got the power for defence was asking for War.

She was proud to say, in the presence of the Air Officer Commanding-in-Chief, Air Defence of Great Britain, that the Air was the best defence against War. The Air Force had saved a great deal of life. She spoke of recent air operations in the Sudan, on the Southern borders of 'Iraq and in the Aden Protectorate. She added that it was pleasant to hear of the progress of the R.A.F. in recent years and the W.R.A.F. learned with special pride of the success of the airships, R.100 and R.101. They only regretted that the days were past when they took part in starting an airship on its career.

She said that Captain Ellington, as he was then, had been Secretary of the Air Committee of the War Office in 1912 and so had been in at the beginning of those great events which had had such a far-reaching effect on the affairs of the country. Since the War Sir Edward Ellington had been in command of the R.A.F. in the Middle East, in India, and of the British Forces in 'Iraq.

Air Marshal Sir Edward Ellington, replying for the Royal Air Force, said that when the W.R.A.F. had left them all had been confusion, but they had settled down. Lord Trenchard had cast about for some employment for them and had found it in many places, including 'Iraq and on the North-West Frontier of India. Now the R.A.F. were the first to whom Political Officers turned when in trouble. Those present would have heard people speak of the cruelty

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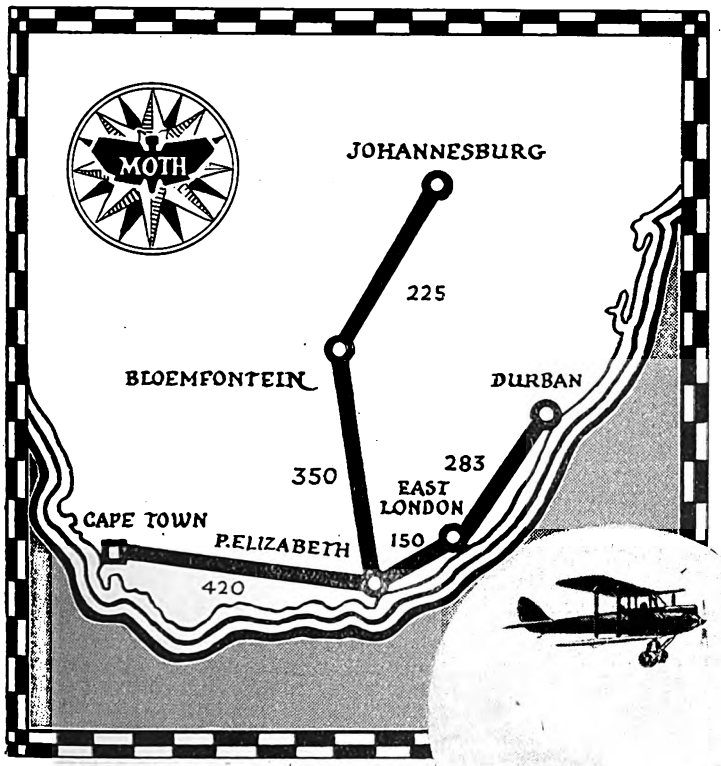
MAILS *by* MOTH



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of bombing women and children, but he could assure them that warnings were always issued in time for all to be sent to safety.

On the North-West Frontier of India the tribesmen had not much sense of humour, but they knew the value of money. Looting and carrying-off people for ransom was a time-honoured custom among them. In such cases the R.A.F. would be called in and life would be made very uncomfortable for the tribesmen. Here the R.A.F. found some unexpected allies. The tribesmen lived in caves and fleas became very active in caves. After being driven into the caves by the R.A.F. they would be driven out again by the fleas and the result was immediate surrender.

Humanity ought to begin at home and in three years there had been only six casualties among the R.A.F. in operations and these had mostly been due to weather conditions. Sir Edward Ellington then proposed the health of the W.R.A.F. Old Comrades' Association.

Replying for the Association, Miss Stevens said that W.R.A.F.'s had many happy memories to look back on and always felt they had a small share in the achievements of the R.A.F. The O.C.A. was still going strong after eleven years and was a part of the lives of all its members. They could always be certain of friends in trouble or in fortune.

Mrs. Durant, proposing the health of the President, said that she had been living in Canada for ten years, but that she had always planned to come back to London for one of these re-unions. With pleasure and pride she proposed the toast.

Replying to the toast, which was received with musical honours, Dame Helen said that anything she had done had been because of the wonderful backing she had received. She always felt that the whole W.R.A.F. had a share in the sash she was wearing (the insignia of a Dame of the British Empire). Referring to the more important work of the O.C.A., that of the Benevolent Fund to help those in trouble, she said that if this work was to go on, every effort must be made to get new members for the O.C.A., the size of which was not proportionate to the 32,000 who had served with the W.R.A.F.—C. M. MCA.

"Flat Out" at Halton.

Four performances of "Flat Out," an original, topical, and technical comic opera by A. C. Kermode and R. H. Cort, were given by the Halton Debating Society at Halton on Mar. 31, Apr. 2, 3 and 5. The play was produced by Mr. Kermode, who also wrote the words of most of the songs, and played entirely by Aircraft Apprentices.

With the exception of one song all the music (some 25 original songs) was composed, arranged and orchestrated by Mr. R. H. Cort, a resident of Wendover, to whose interest in the R.A.F., Halton already owes so much. Many of the songs, both words and music, were far above the average professional efforts and the spirit with which they were sung would have done credit to a chorus with many years of training instead of the few weeks in their spare time which these Apprentices have had.

Whether a very decided talent for acting shown by some of the members of the cast will be of benefit to them in the course of their careers in the R.A.F. seems to be a debatable point, but there is not the slightest doubt that the energy, skill and thoroughness with which all played their parts, turned out a show which as an example of hard-working co-operative entertainment, is of immense value to the whole Service.

It is impossible here to refer to all those who took part in this ambitious production, but one would like to make a special reference to the orchestra, which was very good indeed.—C. M. MCA.

NIGHT-FLYING WITHOUT LIGHTS.

The Air Ministry has issued a notification that R.A.F. aircraft will be flying over two areas at night. These machines will not exhibit navigation lights above 3,000 feet unless other aircraft are observed to be about.

The first area is bounded by straight lines which join Bishop's Stortford, Chatham, Cranbrook, Godalming, Farnborough, Windsor and Bishop's Stortford. Aircraft will fly over this area between 19.00 hrs. and 22.00 hrs. from April 1 to Sept. 1.

The second area is bounded by straight lines which join Reading, Egham, Guildford, Alton and Reading, and aircraft will fly over it between 21.00 hrs. and 24.00 hrs. from April 1 to May 31.

THE BLIND LEADING THE BLIND.

[*The World's Aeroplanes and Airships.* G. Gibbard Jackson. XII+244 pp. Many Illustrations. Sampson Low, Marston and Co. Ltd. 6s.]

During the last twenty years the present reviewer has read most of the books which have been written on aeronautics and published in the English language. This being so, he has no hesitation in telling Mr. Gibbard Jackson that he has written one of the worst books on the subject which the reviewer has ever read. The book is like a Lucky Dip,—whenever you turn over a page you are fairly certain to find a real howler, thus,—

During the war the balloon took on a new lease of life, and its great utility was clearly demonstrated. Usually the globular form was discarded, and an envelope of sausage shape was used. The "blimps," as the strange craft came to be called, were used both over land and over sea . . . . On sighting an advancing squadron of aeroplanes the "blimps" signalled to be pulled down out of sight; too often the signal was given too late, and the sausage-like bag received fatal injuries.

We have yet to learn that envelopes have life, but this is even richer:—

Sometimes the "blimp" had the enemy all to itself, and usually the fight was an unequal one since the craft in the air was not nearly so well armed as the one in the sea. Often, indeed, it had no gun, and only the larger "blimps" were able to make an effective reply to a submarine's guns. As a rule the big "blimps" had motive-power, and ceased to be classed as ballons for this reason, becoming, in fact, miniature airships.

The airship programme of the Royal Navy had many critics during the War, but surely it never deserved as much as this. Mr. Barber's highly original aeronautical work is described thus:—

There was the *Valkyrie*, a strange looking machine, with a double-bladed propeller, the latter placed behind, instead of in front of the pilot.

whatever that may mean. And all poor Cody gets is that he,—

developed the biplane which took his name, and which he was to lose his life in perfecting.

The author states that it was Curtiss who was the first man to fly off the deck of a ship, whereas any work of reference would have told him that it was the late Eugene Ely. The author's chapter on "Aircraft of Great Britain" will cause amusement amongst the various firms in this country (that is, if they ever waste time on reading it), but perhaps its value can be best judged by the statement that of all the products of the Fairey Aviation Company "the most popular" is the *Flycatcher*—and this in a book published in 1930! No further time will be devoted to this book, except to state that it is a menace to the ignorant, and an irritation to the initiated.—C. L. S.-G.

QUI ANTE DIEM PERIIT.

The seventh anniversary of the legal constitution of the Italian Royal Air Force was celebrated in Rome on Mar. 28. Signor Mussolini conferred a number of decorations during the day.

The Medal for Valour was awarded to the widow of Captain Motta, who was killed practising for the Schneider Trophy Contest. The father of Warrant Officer Dal Molin received a similar decoration. The latter was second in the Schneider Trophy 1929, and was killed recently while practising in a high-speed machine.

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AIRCRAFT INSTRUMENTS. By C. J. Stewart, O.B.E., F.R.Ae.S., M.I.M.E. Post free, **£1 2s.**

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ABOVE AND BEYOND PALESTINE. By C. E. Hughes. Post free, **11s.**

"The book is at its best, paradoxically, when not dealing with operations, but when describing the *terrain* and the peoples with which the author came into contact, and certainly he has succeeded in bringing back to the reviewer on a wet January afternoon something of the glamour of the places in which they both have journeyed. In this connection the book is enriched by numbers of pen-and-ink drawings which the author made at the time."—*Mr. C. F. Snowden Gamble in* The Aeroplane *of January 15, 1930.*

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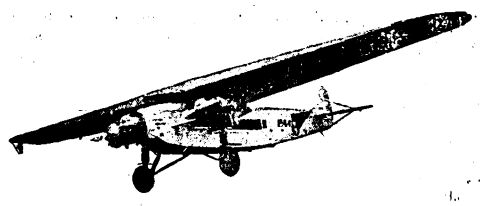

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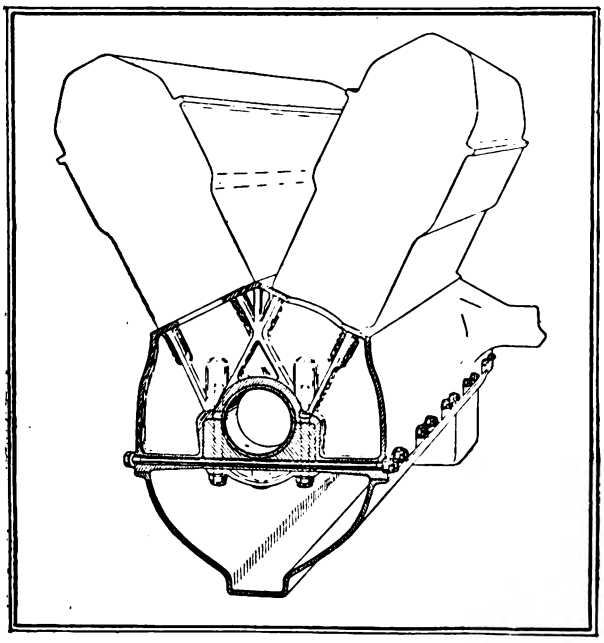

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

EARLY BIRDS AT WOODLEY.

The Berks, Bucks and Oxon Aero Club led off the "amateur" season on Saturday, April 5, with their opening pageant and general flying social afternoon at Woodley, near Reading. They nearly paid the penalty of rashness in having a day of much too seasonable weather, but the fortune that favours the brave brought them a raw and cold, but perfectly flyable, afternoon and a really good crowd of over 4,000. Thirty machines turned up, including a good representation of private owners, and enough diversity of types for an interesting foretaste of what the 1930 season will be.

This is the first of a series of "Pageants" arranged by National Flying Services, and actually marks the first public operation of the Berks, Bucks and Oxon Aero Club, which had existed for some time in the chrysalis, or non-flying, stage, and only started active work within the last six months or so.

At 14.15 hrs. Colonel Sir Leslie Wilson, late Governor of Bombay, fired a white Verey light and declared the clubhouse open. Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, Capt. the Right Hon. F. E. Guest and Miss Diana Guest, were among the spectators.

The programme was confined strictly to flying, plain and fancy, which was very sensible of the organisers so early in the season, before the pursuit of novelty forces committees into providing spectacles that have nothing to do with flying, its improvement or popularity.

The private owners' race was over a course of 30 miles, and Miss Winifred Spooner won it handsomely in a Gipsy-Moth in 18 mins. 37 secs., or an average speed of 106½ m.p.h., thus leading Flg. Off. M. Bainbridge, on a similar machine, by 11 secs. Mr. A. Jackaman flew his Gipsy-Moth into third place 14 secs. later.

The same course was flown by members of the Club, and Mr. H. H. Leach won this race very handily in the Hermes-Avian owned by Mr. H. Player. His time was 18 mins. 13 secs., which is about 113 m.p.h.

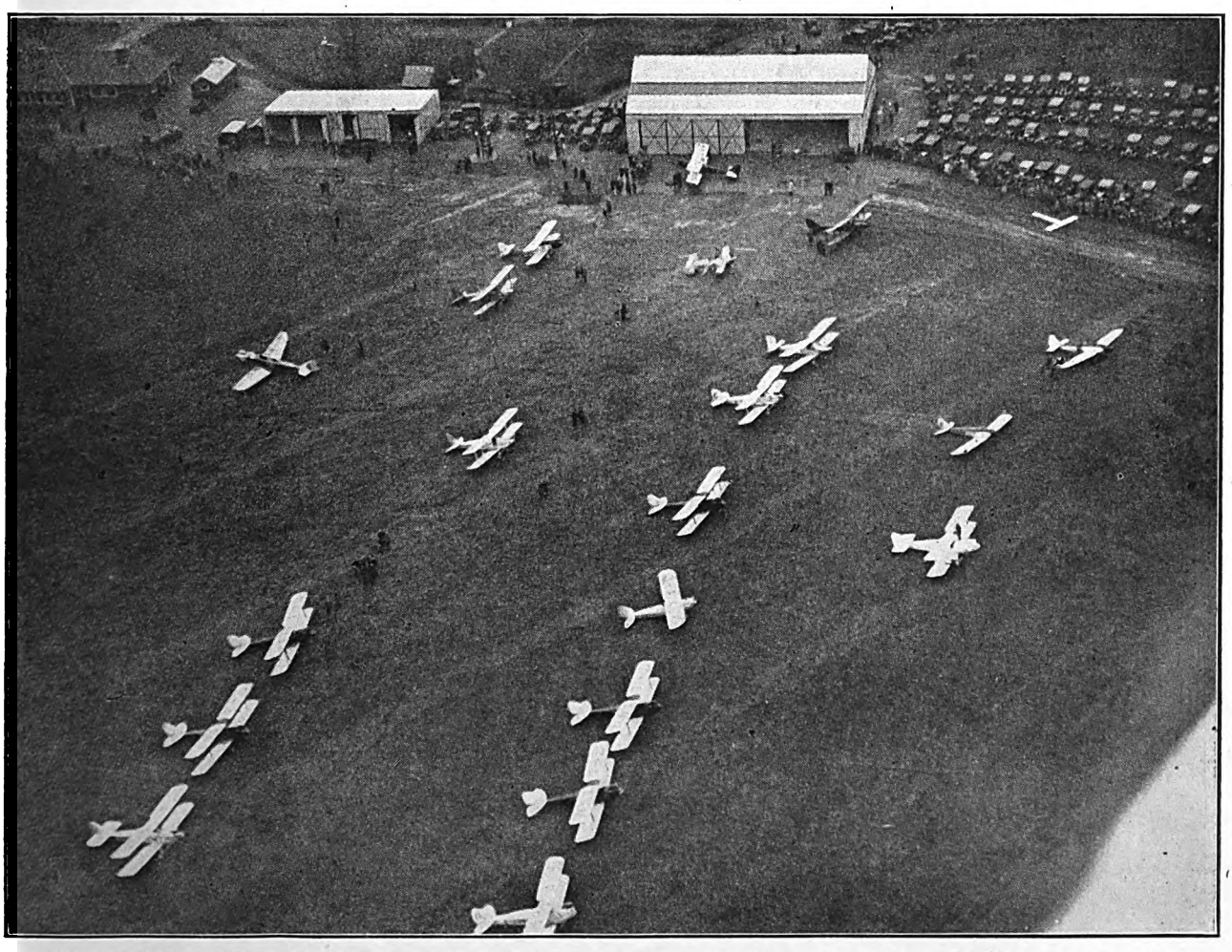
Miss Spooner judged the efficiency competition for beginners. The test consisted of three figures of eight and a landing to the mark from 500 ft. with engine throttled back. The performance was quite creditable in view of the gusty wind. The placings were respectively: Mr. Murray Brown, first; Mr. M. D. Scott, second, and Mr. Field Richards, third.

In the absence of the R.A.F. fighter squadron, which the Club hoped would be the star aerobatic turn, Flt. Lt. H. M. Schofield, of N.F.S., put up a really first-class individual display on a Cirrus-Moth, and the N.F.S. "Circus," consisting of Flt. Lts. Schofield, J. B. Wilson and I. W. C. McKenzie, provided a formation display, also on Cirrus-Moths. The close loops, etc., of this trio promise great things by the time the series of N.F.S. pageants is well under way, as their partnership in this line is said to be quite recent.

The Autogiro, flown by Mr. Rawson, was an object of intense interest and varied comment by the large number of people who had not previously seen one in action. In fact, ringside remarks at any flying meet drive home the point, which is too often overlooked, that what seems like annual and wearisome repetition of events is fresh and thrilling novelty to an unexpected proportion of the public. The very presence of 4,000 people, and a car-park full to overflowing, on a raw, damp day merely emphasises this.

The parachute descent by Mr. John Tranum was left out owing to the absence on the Continent of the principal performer, but Flg. Off. Tanner created a diversion when he joined the fly-past in his D.H.53 wearing a fireman's helmet. "Leon," the Giant-Moth of N.F.S., was highly popular with joy-riders throughout the day, and Flt. Lt. Styran took up 320 passengers in forty flights.

One of the interesting features of the show was the presence of the Cirrus-Klemm. Mr. Rogers, test-pilot for



YOUNG WOODLEY.—The visiting and competing aircraft at the first of a series of N.F.S. pageants held on April 5 at Woodley Aerodrome, Reading, by the Berks, Bucks and Oxon Flying Club.

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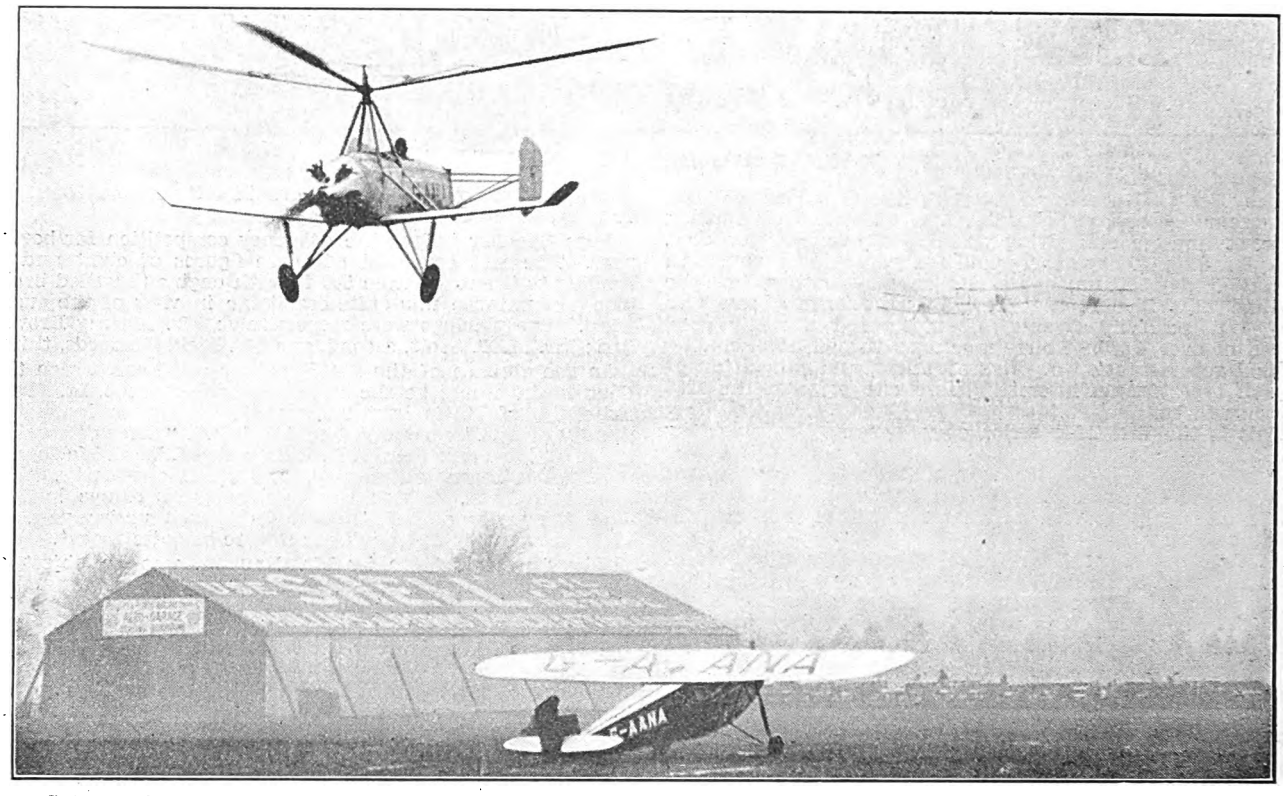

SHELL OUT.—The Autogiro, the N.F.S. Circus formation of Cirrus-Moths and a Desoutter cabin monoplane at the Reading Air Meeting. In the background is the Phillips and Powis shed with words of good advice on the roof from the universal providers.

S. T. Lea Ltd., British agents for the Klemm monoplane, put it through its paces amid the curiosity of those who have admired the performance of this monoplane with 20 and 40 h.p. engines. The fitting of the Cirrus engine brings it into the class of what current and popular prejudice considers the practical light aircraft. In other words, the Cirrus gives it a cruising speed less subject to head-winds, apparently without affecting its distinct merits in other directions. Let us hope that all designers, and improvers, will take the opportunity of adding so decidedly to the interest of flying meetings as to "show their flag" at as many as possible, and reap the benefit of public interest in consequence.

A Timely Comment.

As aptly noted by Major Oliver Stewart, Aeronautical Correspondent of *The Morning Post,* this is the proper time of year to begin eliminating the dangers of flying meetings. Already the period is gone when the skies were wide open for the careless, the clumsy and the plain foolish.

At flying meetings especially, when a goodly proportion of beginners dispute the landing space with pilots of experience, the crowded state of the local air is going to be a very real danger unless traffic rules are kept and precautions stringently enforced. The organisation at Woodley was sound enough if more adequate enforcement had been possible. As it was, the attendance of machines as well as spectators was much larger than the weather led the Committee to expect, and there were several moments when a mishap seemed to be averted only by inches and good luck. A traffic officer on the field, with flags to signal landings and take-offs, will be a necessity if 1930 fulfils its promise of being a big year for flying meets.

Collision is undoubtedly the greatest single danger in flying as it is done to-day, and where many pilots of all calibres are gathered together the danger becomes serious. One accident undoes all the benefits achieved by half a dozen successful meetings, and now is the time to postpone indefinitely the first mishap due to disregard of simple precautions.—F. D. B.

THE LIVERPOOL AND DISTRICT CLUB.

On Saturday, April 5, the Liverpool and District Aero Club were "at home" on the occasion of the opening of their new Club-house.

The proceedings were timed to begin at 14.00 hours with an arrival competition for visiting aircraft. This was won by Mr. Norman Blackburn, who arrived 20 seconds ahead of time. In all there were nine visiting aeroplanes, which, considering the day and the other pageants, was a good turn out.

The Club-house—built in the form of an open-sided square—faces the landing-ground. Aeroplanes can taxi up to the front, and adjoining it is the new filling station. A paved forecourt offers a pleasant and sheltered open air tea space in summer, and leads to an open-fronted verandah across a bar-lounge. A door at either end of the verandah gives into the tea-room at one side, and on the other to the secretary's office and reading-room, so that these may be reached without entering the bar lounge.

THE NEW HOME.—The new Club-house of the Liverpool and District Aero Club at Hooton Aerodrome with one of the Club's Avro Avians standing in front.

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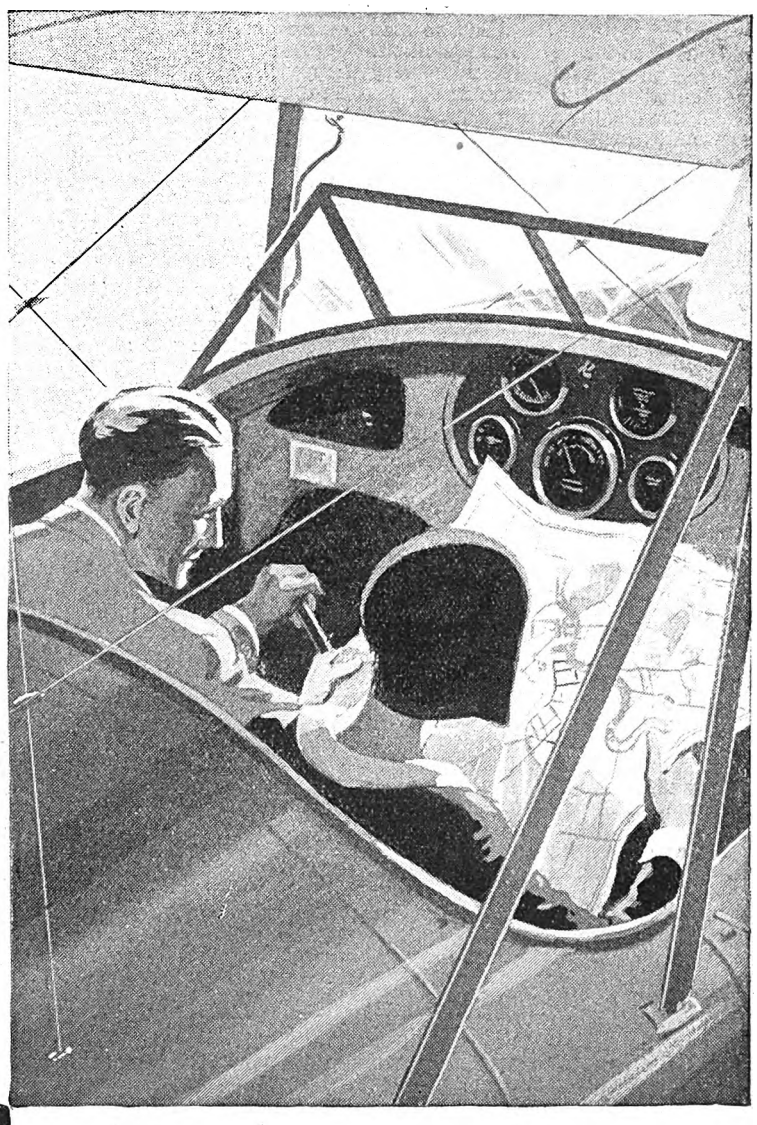
"Rather, Jimmy, I think it's simply marvellous! It's just like sitting in the car, isn't it. Wonderful idea of Blackburn's."

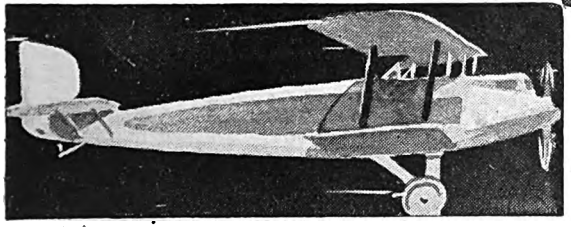
"Well, *they* ought to know what's what in aircraft. They've been at it for twenty years or more. Do you know, this Bluebird is the only English plane with side-by-side seating?"

"Is that really so, Jimmy? I can't imagine anyone wanting separate cockpits, and telephones and so on, after this."

"Oh it's a wonderful job in every way, the Blackburn Bluebird. Entirely metal construction, self starter—just like a car, as you say."

"Yes, where are we now? Let's have a look at the map."





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The kitchen and canteen occupy the small building hitherto used as a club-house and are connected to the new building by a short passage. Commodious cloakrooms for ladies and men are provided with a plentiful supply of hot and cold water. The bar lounge, 30 x 15, is a cheery room.

The formal opening was performed by Lady Bailey, who—*mirabile dictu*—arrived by car, thereby severely handicapping herself, but at the same time creating a new record. Colonel Jerrett, the chairman of the Club, explained the extremely satisfactory reasons leading up to the building of the club-house, and thanked the staff, whose exertions had contributed so largely to the position.

Lady Bailey, replying in a very happy little speech (punctuated by the snapping of the Press cameras), expressed her delight at being present and hoped that Merseyside would appreciate the very magnificent landing-ground and equipment which it possessed at Hooton. Apparently it is beginning to do so, as we noticed the Mayor of Birkenhead amongst the distinguished guests, and understand that Birkenhead contributes annually towards the expense of the club in laying down and maintaining a landing circle.

Field-Marshal Lord Allenby, who was visiting the Eastham Memorial, motored over shortly after the official opening and honoured the club by signing the visitors' book.

Despite rain, the four club aeroplanes were employed taking up passengers and potential members, including the Mayor of Birkenhead.

A competition for visitors was won by Flt. Lt. Rose. Messrs. Ambler and Woodhead were second and third respectively.

THE NORTHAMPTONSHIRE AERO CLUB.

Sunday, April 6, marked the opening of the new lounge of the Club House of the Northamptonshire Aero Club at Sywell aerodrome. The preparations for the opening were many, and everything was held up by the inability of the workmen—common to most builders and decorators—to finish their job by the specified date. Indeed, on Friday afternoon everything pointed to an opening of distinctly novel character—when the decorations of the room to be opened would consist of pots of paint, brushes, shavings, planks and carpenter's tools!

However, by real hard work the Ladies' Committee (in whose hands the furnishing and arranging had been placed and by whose hands most of the work was actually done!) had things straight and tidy.

Many friendly pilots arrived on Saturday evening and a few more on Sunday morning.

The actual opening took place at 3 p.m., and Sir Sefton Brancker, ever ready to help any Aero Club, flew down in a Desoutter to perform the ceremony. This was rather original.

Three Moths took off, the first piloted by Mr. G. Linnell (the Moth by the way has quite recovered from its little game on Brighton beach) with his brother as passenger carrying a large golden key. The escorting Moths were flown by Flt. Lt. Rose and Mr. Palmer, the Club Instructor. The golden key was dropped by parachute, and fastened to it was the one really belonging to the Club House. With it Sir Sefton—after a very nice speech—unlocked the door.

The Desoutter had to go away almost immediately after the opening and Sir Sefton carried off the golden key as a souvenir.

This was the first visit to Northampton of a Desoutter and everyone was most interested. The pilot was most kind and generous in giving flights to members.

A wonderful exhibition of aerobatics was given by Mr. George Murray from the Brooklands School of Flying. His inverted spinning and gliding, and his slow rolls were amazing to watch, and many people considered it the best aerobatic show seen at Sywell.

Flt. Lt. Rose went up to amuse the crowd, which he thoroughly succeeded in doing. Some people were filled with admiration and some with horror at his flat turns!

The following pilots arrived during the week-end and helped with the opening:—

Messrs. Surtees, Cubitt, Brett and Gough from Norwich; Flt. Lt. T. Rose and Mr. Davis came on from the Liverpool Meeting and inveigled Mr. Blackburn and a friend to come as well; Mr. George Murray and Mr. R. Oldmeadow from Brooklands; Mr. R. Bentley; Mr. K. Whittome who flew a new Moth from Peterborough; and Mr. Runtz-Rees who motored from Brooklands.

Considering the general cold and dull state of the weather a large crowd of members turned up, and along the roads adjoining the aerodrome were the usual crowd of opulent cars containing people too poor or too mean to pay the necessary guinea which would enable them to enter the aerodrome as members.

THE S.B.A.C. CUP.

The Royal Aero Club has decided that the Challenge Cup presented by the Society of British Aircraft Constructors for competition amongst the Light Aeroplane Clubs shall be competed for at the Bristol Air Pageant to be held on May 31.

Cash prizes of £75 have also been presented by the Society of British Aircraft Constructors.

The Bristol Air Pageant marks the opening of the Municipal Air Port by H.R.H. Prince George.

THE INTERNATIONAL TOURING COMPETITION.

Intending competitors are reminded that the entries for the International Touring Competition close on Apr. 15. Entries from British competitors should be sent to the Royal Aero Club. The entry fee is 1,000 francs (£8). Late entries, at double fees, will be received up to May 15

THE LEICESTER FLYING MEETING.

On Easter Saturday, April 19, the Leicestershire Aero Club will hold its second Flying Meeting at Desford aerodrome.

The preliminary programme will open at 12.00 hrs. with an "En Tout Rally" or Arrival Competition and the first machine to arrive after 12.00 hrs. will receive a prize.

This will be followed by a display of individual aerobatics, a formation display by three Club-trained soloists and a parade of aircraft.

At about 15.00 hrs. Sir Samuel Hoare will formally open the afternoon programme.

Thereafter will follow a display by No. 19 (Fighter) Squadron, R.A.F., by kind permission of the Air Ministry and of Wing Cdr. F. L. Robinson, D.S.O., M.C., D.F.C., officer commanding the R.A.F. Station, Duxford.

Other events will include a delayed parachute jump by Mr. John Tranum, a Message Dropping competition and the Desford Grand National.

This last-mentioned event will be for "B" pilots flying folding-wing aircraft only.

The procedure for competitors will be as follows. Competitors will taxi to the starting line, stop their engines and remain in their seats. On receiving the starting signal given by a white Verey light, pilots will fold and secure their wings. They will then race on foot to the Stewards, eat a biscuit, drink a glass of lemonade, and sign a membership form. They will return to their machine with a streamer, which they will hand to their machine Steward, open their wings, start the engine and take-off. After making one circuit outside the aerodrome boundary they will approach the aerodrome into the wind and the first pilot to cross the finishing line will win the prize.

Entrants taking off without opening their wings or starting their engines will receive a special prize.

The active proceedings will close by exhibitions of trick flying by well-known pilots, and this will be followed by the presentation of prizes by Mrs. W. Lindsey Everard, wife of the President of the Club.

All visiting pilots will be regarded as guests of the Leicestershire Aero Club during the period of their stay in Leicester and accommodation for them is arranged for at the Bell Hotel. The Secretary would be glad if pilots would let him know at once whether they require a room.

The Club is arranging an informal dance for the evening of April 19 and it is hoped that this will be well supported and made into a really good party.

All correspondence in connection with this Meeting may be sent to the Honorary Secretary, Mr. Harry Purt, c/o the Leicestershire Aero Club, Bell Hotel, Leicester.

EXPLANATIONS.

A few days ago Mr. R. N. Chawla who completed his remarkable flight from India on Mar. 21, called at The Aeroplane office and explained sundry points which have hitherto been in doubt about his flight. In the first place Mr. Chawla himself is not a Parsee. He is in fact a Punjabi from Lahore and claims to be essentially an Indian—albeit most Punjabis claim that India begins East of the Indus.

Secondly, owing to a misunderstanding by the photographer who sent the photograph which appeared on page 539 of The Aeroplane of Mar. 26 the wrong man was indicated as Mr. Chawla. He is the taller of the two.

Thirdly the name of his companion really is Mr. Engineer. Apparently as a boy at school he was nicknamed Mr. Engineer because of his fondness for mechanical things and he has now adopted the name officially: and incidentally, *he* is a Parsee.

Fourthly, the Moth which was used for the flight belongs to Mr. Engineer, or rather his father, as he himself is only seventeen years of age, and Mr. Chawla undertook to pilot it on this great journey.

The reason they alighted at Thetford was that in crossing the Channel from Calais they made more northerly drift than they expected, and owing to mist they did not see the Kentish coast at all. The result was that they flew over water for forty minutes and then struck the coast at Clacton where it runs South-West and North-East, very much on the line of the coast between Folkestone and Dover. Thence they flew North-West by compass still in a mist, till they came to the conclusion that they ought to have reached the Thames. Not seeing it they alighted and found themselves at Thetford.

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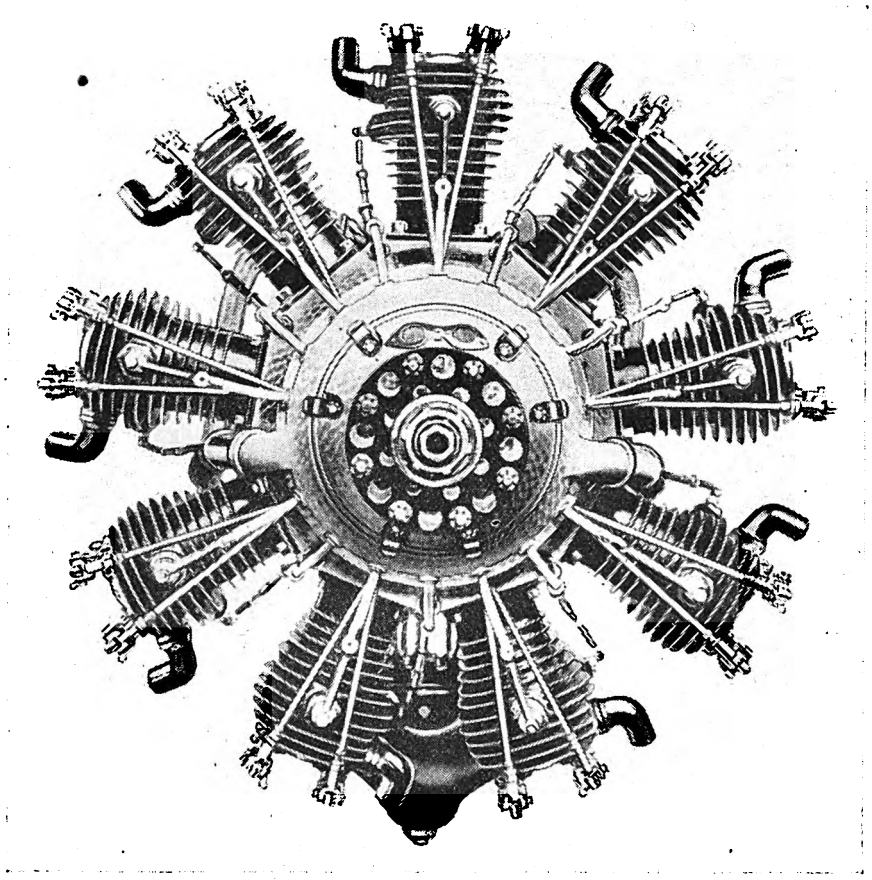

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INDIANS AS PILOTS.

The Karachi *Daily Gazette* of Mar. 21 contains the following account of an interview with Flt. Lt. W. Jones, R.A.F.O., Instructor to the Karachi Flying Club, on the subject of the successful flight from India to England by Mr. Chawla, who learned to fly at the Karachi Club:—

Chawla represents the type of Indian from which good aviators may be made. He has a distinct bent for aviation, a mechanical mind, is self-controlled, cautious and disciplined, and realises that there is always something more to be learned about flying. He also takes meticulous care of his machine and leaves nothing to chance.

As far as my experience goes, I see no reason at all why, eventually, Indians should not make as good airmen as those of any other nation. There are certain facts which have to be borne in mind, one of which is that aviation in India is still in its babyhood, and that, generally speaking, Indians are not so used to mechanical means of transport as are the people of western countries.

At present I find that Indians are apt to be too hasty—once they have mastered the elemental principles of handling an aeroplane, they are inclined to think that is the end of the matter. It is not so. The attainment of the "A" licence is no criterion of a man being a reliable pilot.

This tendency to hastiness must be counteracted if pilots of reliability are to be produced. A sense of strict discipline must be inculcated, and more diligence shown, before the holders of "A" licenses can become qualified as commercial pilots. A lot of hard work has to be performed.

The same phase has been gone through in all countries. It is due, mainly, to an over-exuberant spirit. But over-exuberance breeds carelessness, and that cannot be tolerated in air matters. A professional pilot must be above reproach. He cannot afford to make one slip, no matter how trivial. A forced landing due to carelessness or inefficiency in an emergency, even if only slight damage is caused to his machine, spoils his reputation and deprives him of public confidence.

Due to what I have mentioned before, most Indians are slow to learn to fly, but I have seen some very good pilots amongst them. Chawla is an example. He, too, is exceptional in that he is blessed with a sense of caution and is not likely to take undue risks or to do too much. It is this sense of responsibility which is required of a pilot.

On the whole, I think there is enough material in India from which good commercial pilots can be produced, but it is not advisable to be in a hurry. Much steady work has to be done. The hot-house methods of training which suited war purposes cannot be carried out in the sphere of commercial flying.

HULL WAKES UP AGAIN.

The fine new Clubhouse of the Hull Aero Club (National Flying Services) will be officially opened by Air Vice-Marshal Sir Sefton Brancker on Saturday, Apr. 12.

There is to be an Air Pageant in celebration of the event. One of the main features of this will be an Air Race open to private owners and club members, the first prize will be a handsome trophy presented by Sir Arthur Atkinson, President of the Club.

A cordial welcome is extended to all civil flyers for the gathering on Apr. 12. Further particulars may be had from the Hon. Secretary, Mr. Mark Goulden, *The Evening News*, 42, Whitefriargate, Hull.

THE LONDON AEROPLANE CLUB

The London Aeroplane Club will be open on Good Friday, Saturday and Easter Sunday and will be closed on Easter Monday and Tuesday.

A FATAL CRASH AT FELTHAM.

On Apr. 6, an N.F.S. machine, reported by *The Morning Post* as a Blackburn Bluebird, crashed at Feltham and caught fire. The pilot, a pupil of N.F.S., Mr. George Edward Watts, was dragged clear by four men, three of them from the R.A.S.C. depot, but died on the way to hospital.

THE FLYING CLUB GRANT.

In the House of Commons on Apr. 2, Mr. Everard asked the Under-Secretary of State for Air whether the £10 grant for each licensed pilot would be given annually to the Approved Club or only once on the pilot obtaining a licence.

Mr. Montague said that a £10 grant would be paid to the Club in respect of every pilot's licence issued or renewed for a member, subject to the conditions laid down in the agreement with the club being satisfied: consequently, subject to those conditions, if a pilot renewed his licence each year the grant was annual.

A SOUND SUGGESTION.

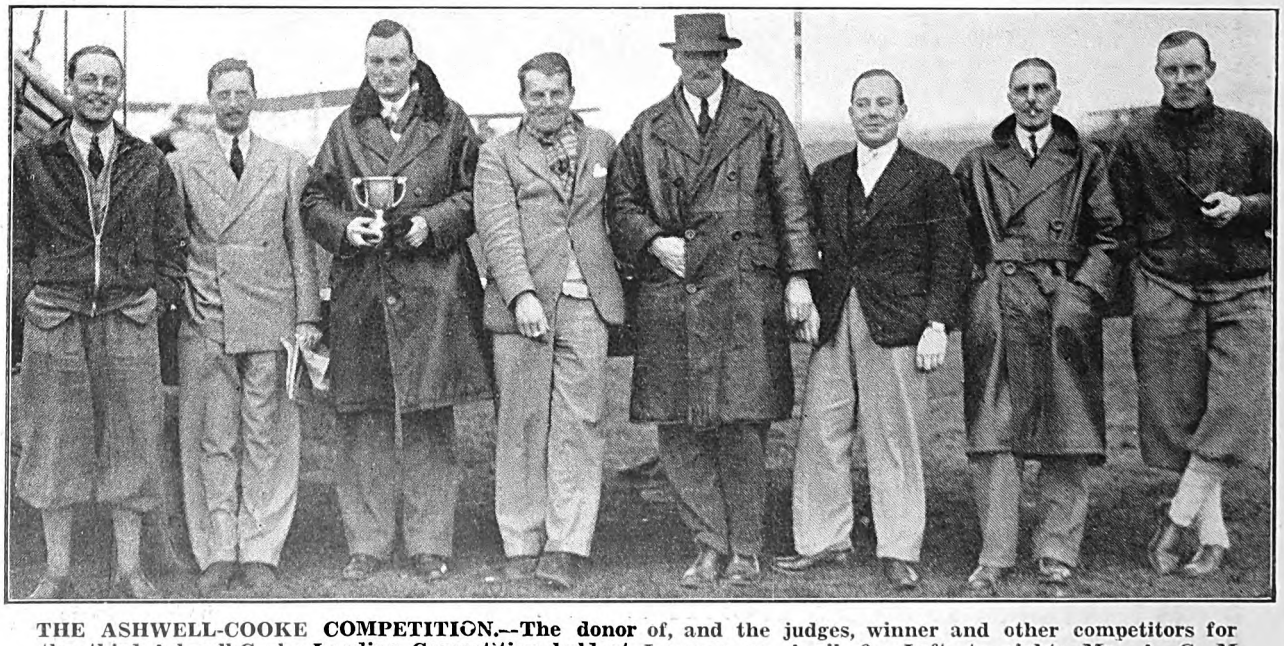
Sir,—The account in the Daily Press of the terrible fatal accident which occurred on Apr. 6 to a pupil of National Flying Services Ltd. at Hanworth, prompts me to write to you to put forward a suggestion. It appears that a certain cook in the R.A.S.C., who was at work near the scene of the accident, displayed unselfish courage of the very highest order in making repeated attempts to extricate the unfortunate pilot from the burning wreckage. This is not an isolated instance. There have in the past been several occasions upon which members of the public, in no way connected with aviation, have risked their lives or, at least, terrible injuries, by exposing themselves to dangerous petrol fires in plucky attempts to rescue pilots of wrecked aircraft.

Where the rescuer is an officer, N.C.O. or Airman of the R.A.F., appropriate steps can be taken, by means of promotion or otherwise, to recognise his valour, but in cases where a civilian or a member of another service performs such an act then it seems that his just reward should not be left to chance benevolence but that some scheme should be established whereby such persons should be certain of such recognition of a public nature, accompanied if possible in suitable cases by a tangible reward.

The proper authority to deal with the matter would seem to be the Royal Aero Club as being the controlling body for the sport of Aviation. What about a Royal Aero Club Medal and a fund out of which payments could be made to these men so that at any rate they should suffer no financial loss as a result of injuries brought about by their heroism? Everyone in Aviation must feel an obligation to them.

The Cinque Ports Club. (Signed) R. Dallas Brett.

[Mr. Brett's suggestion deserves the consideration of the various aeronautical bodies. Either the Royal Aeronautical Society or the Royal Aero Club or the Air League might very well present a medal or certificate to anybody performing an act of gallantry of this kind. As a matter of fact such acts of gallantry make a man eligible for the Albert Medal or for an M.B.E. But in the event of nobody seeing fit to bring such acts to the attention of His Majesty the King, in whose hands lies the conferring of such decorations, the aeronautical organisations might take action.—C. G. G.]



THE ASHWELL-COOKE COMPETITION.—The donor of, and the judges, winner and other competitors for the third Ashwell-Cooke Landing Competition held at Lympne on April 6. Left to right: Mr. A. C. M. Jackaman, Flg. Off. F. F. Barrett (judge), Mr. C. R. Dallas Brett (winner), Mr. T. R. Law, Mr. R. G Cazalet, Mr. A. R. Ashwell-Cooke (donor), Mr. H. E Twaite (judge), and Mr. K. K. Brown (instructor, Cinque Ports Flying Club).—("*Aeroplane*" *photograph.*)

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THE LANCASHIRE AERO CLUB.

Whether it be the advent of Spring, or a desire to take advantage of the old Subsidy Agreement while it lasts, or a gesture of defiance to the powers that be in answer to their action in cutting down the Subsidy is hard to say, but the fact remains that the month of March has been one of the most satisfactory in the history of the Club.

Our Chief Instructor, Mr. Hall, has completely recovered from his accident and is now hard at work again. One says "hard at work" advisedly, as he has thirty-seven dual instruction pupils to deal with at the moment. Fortunately Mr. M. A. Lacayo, our first *ab initio* trained pupil, has now got his "B" Licence and has been approved as a voluntary assistant instructor. Fourteen new flying members have joined during the past few weeks and the number of active flying members is greater than at any previous period.

Although only three Avians have been in service during the month the Club's personal record of seventeen hours fifty minutes flying in one day has thrice been closely assailed during the month. G-EBMQ, the original Mark I Cirrus Moth presented by our President, Lord Wakefield, will shortly be in commission again completely reconditioned, and the new all-metal Hermes-Avian which he is now generously presenting to the Club is expected by the middle of April. With the arrival of Summer Time, therefore, the Club confidently expects that all Club records for flying hours will be easily beaten.

A hard tennis court is being constructed and the Clubhouse premises are soon to provide sleeping accommodation for members anxious to learn to fly in the shortest possible time by starting early in the morning.

[One cannot recollect hearing of the delivery to the Club of the aeroplane promised to it at the inaugural lunch by Lt.-Col. Groves on behalf of the Manchester Brewers.—C. G. G.]

THE RISING GENERATION.

A recent paragraph in The Aeroplane about Harrow County School has produced the information that Chillon College, Villeneuve, Switzerland, also has an Aviation Club of its own. It has about twenty-five members who meet every Saturday afternoon, run model competitions, and argue about aviation generally. They have a fairly large library of aeronautical books, and they take The Aeroplane and other English and American aeronautical papers. Also they run a club magazine, once a month, which is written in rather better English than is the average London newspaper.

British manufacturers who would like to increase the air-mindedness of the rising generation may do good work by sending interesting literature to the Secretary of the club any time after Apr. 25, when people return from their Easter holidays.

GLIDING.

A CROSS-CHANNEL PRIZE.

The British Gliding Association are fortunate in having secured another handsome prize for competition. Mr. A. J. A. Wallace Barr, on behalf of Cellon Ltd., has offered a prize of £1,000 for the first all-British glider flown by a British pilot which crosses the English Channel between June 1, 1930, and May 31, 1932. The prize is to be competed for under the rules of the Royal Aero Club.

In 1922 Mr. Barr offered a prize of £50 for a glide of 50 miles in a straight line. This prize, which has not yet been won, is still open. Much greater distances than this have been covered by sailplanes in Germany, and there seems a very good chance of somebody winning the £50 in the not distant future.

Until the rules under which the £1,000 competition will be held are made public there is little comment that can be made. There is the obvious criticism that such a big prize offers inducement for *felo-de-se* by drowning. No doubt the B.G.A. will exercise every care to prevent unwelcome publicity of this kind

Will the Channel have to be crossed from England to France, or France to England? Can the glider be towed behind an aeroplane to any height? If it can be so launched, presumably a machine with a really good L/D ratio could win the prize by being towed up a couple of miles and then sliding down again across the Channel.

But these are idle assumptions, and we must await the rules. What with gliding and the Channel Tunnel, the popular Summer method of crossing the water by swimming will be put right in the shade.

"THE DAILY MAIL" AND GLIDING.

The Daily Mail announces that it will institute an important competition for gliders in the Summer of 1931. The competition is open to all nations and *The Daily Mail* says that it is being organised in conjunction with the Royal Aero Club to give further encouragement to those at present carrying on a single-handed battle.

This is good news for the Gliding Clubs who will benefit by this new publicity and by the added incentive to achievement. The Gliding Contest at Itford in 1922 was the result of *The Daily Mail's* £1,000 prize,—which was won by M. Maneyrol with a flight of 3 hrs. 22 min.

The competition is open to all nations, which means that the English Clubs will have to compete against the accumulated knowledge and experience won in the last ten years by the Germans.

The British Gliding Association will have to start a meteorological section whose duty will be to discover the sites where the conditions are most favourable and to chart the flow of air-currents under given conditions. If Gliding or Soaring Flight is to make any headway in this country, the gliders and meteorologists must put their heads together.

THE FIRST GLIDING SCHOOL.

Sir Sefton Brancker, at the Inaugural Meeting of the British Gliding Association, which was reported in The Aeroplane for Apr. 2, 1930, said that a school for gliding was shortly to be started. Some particulars of the proposed school are now available.

A company is now in the process of formation to establish such a school which will be within two hours of London by road. The school will be run on camp lines similar to those found practicable in Germany and should provide an attractive form of holiday-making, especially if it happens to be near the sea.

For an inclusive fee people will be trained to qualify for the Glider Pilot Certificates, classes A, B and C, and while training will be boarded at the camp.

The directors are: Colonel the Master of Sempill, A.F.C., A.F.R.Ae.S. (Chairman), E. C. Gordon England, A.F.R.Ae.S., L. Howard-Flanders, A.F.R.Ae.S., M.I.Ae.E., A.M.I.Mech.E., and Mr. R. F. Dagnall. The company is being organised by Mr. R. G. Russell-Taylor, who will be the first instructor. Mr. Russell-Taylor will shortly be going to Germany to acquire his "A," "B," and "C" Gliding Licences.

GLIDING IN LANCASHIRE.

Activities began on Sunday, April 6, when a number of experimental flights were made with the Lancashire Aero Club's Prufling Glider to test the rigging and controls. Altogether fifteen flights were made and ten pilots flew the machine.

The machine was catapulted off the level into a Westerly breeze of 20-25 m.p.h. Seventy yards of ⅝-inch "Sandow" elastic (otherwise known as bunjy) was used and to avoid any risk of the elastic failing to become detached from the hook no loop was made in the middle. The Prufling is considerably heavier and faster than the Zogling and it was found that for a successful launch off level ground at least ten men were needed on the ropes and two on each wing-tip to hold the machine back. As many as sixteen can pull on the ropes without causing any undue strain.

The wind was unfortunately in the wrong direction so the natural slope of the aerodrome was not usable and only short flights were possible, but a maximum of over 200 yards in distance and over 15 seconds in duration was achieved.

The following pilots flew the machine in the order named:—A. Goodfellow, Flg. Off. Tomkins, R. H. Dobson, R. F. Hall, J. C. Weale, B. A. G. Meads, A. C. Mills, J. C. Lister, H. C. Greg.

Preliminary practice will take place on the aerodrome at 3.0 p.m. on Sundays (weather permitting) until further notice, pending the completion of negotiations for a suitable site in the hills.

An experienced pilot who flew the machine writes:—

It is too early to say yet, but I am very favourably impressed with the machine so far. Apart from rather inadequate rudder controls (due no doubt to the deep keel section of the fuselage) she handles extremely well in the air. She is very stable laterally, as one would expect from the low centre of gravity, is very light on the elevator controls, and lands easily and smoothly with no tendency to bounce off again. Possibly we may have her swinging on the wing-tip after landing with little or no head wind, but we had no trouble of this kind yesterday. She simply landed on the skid, came to rest with a very slight forward pitching motion, and then sank gently onto one wing-tip.

On my last flight I deliberately held her up to stalling point about fifteen feet off the ground. She simply began to sink on an even keel and by putting the nose down a little one immediately regained sufficient elevator control for a normal landing. Altogether a machine of distinct possibilities.

Nevertheless I am afraid that another of my cherished illusions vanished yesterday. I was led on by Howard Flanders to believe that it made no difference whether the pilot weighed ten stone or thirteen. Believe me it does! I have come to a working agreement with the Prufling: as long as I am content to come down about twice as gently as I should on an ordinary machine she will stand for it, and the less I muck about with the controls the better she will fly and land herself. Any attempt at soaring on my part, however, will be firmly dealt with by an immediate sinking feeling. I have promised to go into training and cut down fat-forming foods in the hopes that she may reconsider her decision.

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COMMERCIAL AERONAUTICS.

THE TECHNICAL ORGANISATION OF THE COMPAGNIE GENERALE AEROPOSTALE.

On April 3 Monsieur Grimault, the Technical Director of the Compagnie Générale Aéropostale, read his paper on the technical organisation of his Company before the Royal Aeronautical Society. One was rather struck by the absence of the people one would have expected to attend such a lecture, the more so as M. Grimault had come specially from France to deliver it. One would have thought too that the ordinary member would have been present in large quantities to have learnt something of the ways in which another country has organised such an outstanding mail service, especially as mail-carrying is now the most promising way of making air transport pay. The only representative of Imperial Airways present was Sir Vyell Vyvyan, and if any of the others who pose as being keenly interested in air transport were there one missed seeing them. Several manufacturers were there, notably Sir Robert McLean of Vickers Ltd., and Mr. Handley Page.

Two important points in the discussion were first the statements by Sir Vyell Vyvyan, a director of Imperial Airways, that the line to India only averages 30 m.p.h. and that this was nothing like fast enough; secondly the fact emphasised by Colonel Sempill that Imperial Airways Ltd. cannot be persuaded by the Royal Aeronautical Society to give any paper like those recently read by Major Wronsky of the Luft Hansa and the present paper by M. Grimault. Apparently our one air line intends to create a monopoly of knowledge as well as of subsidy.

THE LECTURE.

M. Grimault opens his paper by summarising the routes covered by his company. There are three main routes. The first and greatest is from France to Chile by way of Toulouse, Casablanca, Saint Louis, Natal, Rio de Janeiro, Buenos Aires and Santiago, the next is from Marseille to Algiers, and the third, which is only operated in the Summer, is from Paris to Madrid by way of Biarritz.

Subsidiary lines run between Bordeaux and Toulouse, between Marseille and Barcelona, between Buenos Aires and Asuncion, and between Buenos Aires and Rivadavia by way of Commodoro.

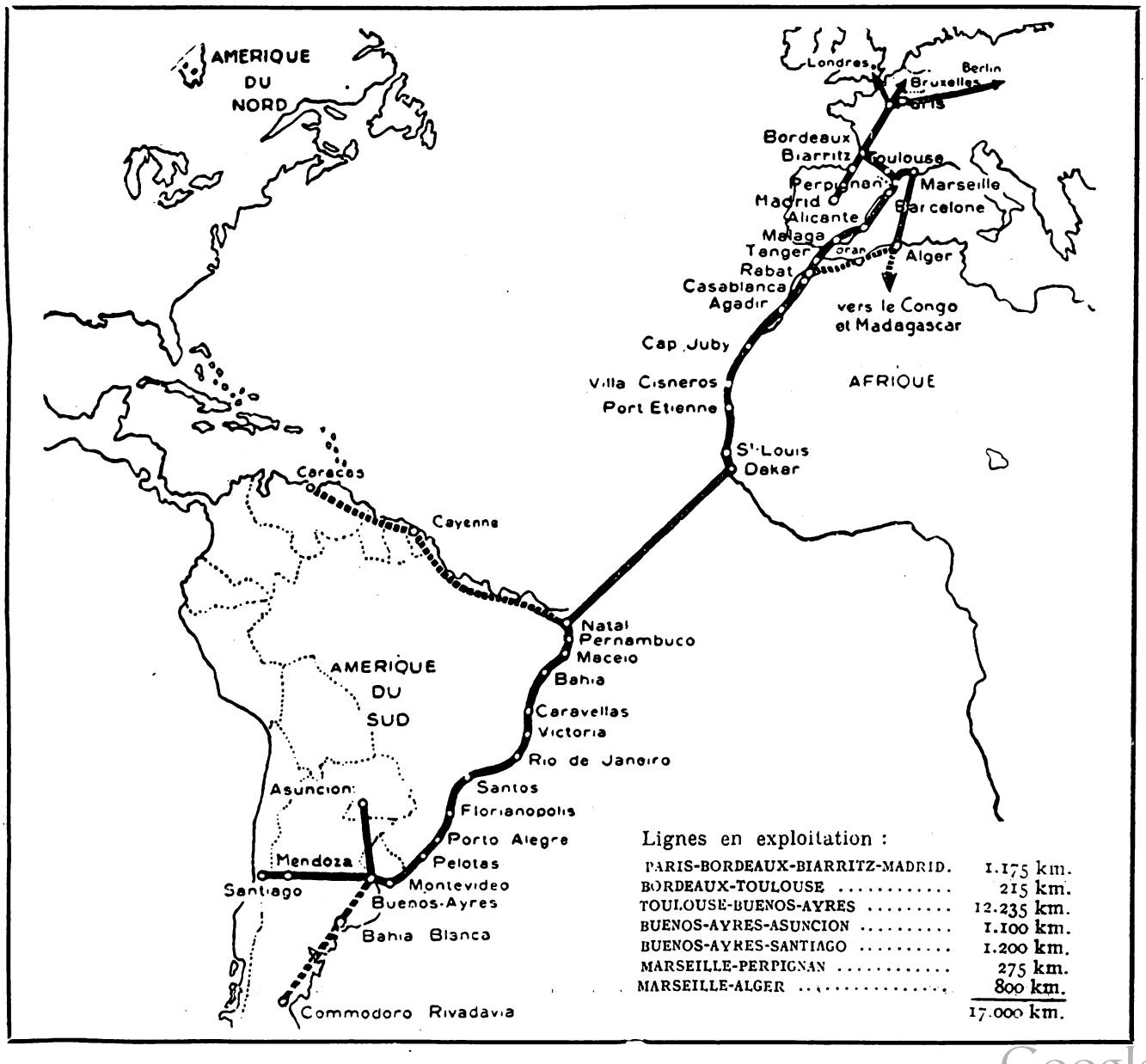
The total length of the system is 18,325 km. (11,400 miles) and except for the 3,200 km. (1,990 miles) crossing of the Atlantic is covered by aircraft throughout.

The first serious obstacle on the Main Line is between Toulouse and Casablanca, this is the crossing of the Pyrenees through the Perthus pass at 1,000 m. (3,280 feet). The route then follows the Spanish coast where the Sierra comes down to the sea. The rocky coast offers no facilities for a forced landing and the making of landing grounds is not easy. From Tangier to Casablanca the chief source of trouble is the frequency of mists along the West Coast of Africa. The journey between Toulouse and Casablanca is made daily and is available for passenger traffic.

The route from Casablanca to Dakar follows the coast and from Agadir to Port-Etienne is over desert country where the Spanish posts of Villa Cisneros and Cape Juby are the only landing places where fresh supplies can be obtained. The hostile tribes who infest the desert outside these posts hold to ransom anyone who falls into their hands.

Flying conditions are not often very good. Mist and haze are prevalent on all the coasts. Sandstorms are frequent and are the cause of wear and tear in the engines. The high temperatures make particular attention to the fuel supply and cooling of the engine essential.

The ocean crossing between Dakar and Natal (Brazil) is by fast boats. They have been lent for this purpose to the Company by the French Navy and have a speed of 16 to 18 knots. Six boats are available of 1,000 tons displacement driven by 6,000 h.p. turbines.



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The route from Natal to Buenos Aires follows the coast-line where either the coast is rocky or the forests come down to the shore. Thick clouds and torrential rain restrict the visibility. Much work was needed to clear the luxurious tropical growths for landing grounds, and daily attention is needed to keep them clear.

Between Buenos Aires and Santiago are the Andes, many of the passes of which are at 4.000 m. (13,000 ft.) and because the Pacific gales cause violent descending currents, the aircraft have to fly at least at 5,000 m. (16,500 feet). This section of the route is only flown once a week in each direction.

The normal maximum stages are 600 km. (370 miles) in length, but between Casbalanca and Dakar there are a number of original landing-grounds now in use as emergency landing-places which make possible the extension of the stage from 600 to 1,000 km. (621 miles).

The compulsory landing-grounds are Barcelona (Spain), Tangier, Rabat, Casablanca, Agadir (Morocco), Pernambuco, Bahia, Rio de Janeiro, and Monte Video. These are exclusive of such terminal points as Toulouse, Dakar, Natal, Buenos Aires and Santiago.

Each aerodrome has one or two aircraft in reserve. When a machine comes in one of the reserves is ready to take-off and to it the passengers and mail are transferred. By these means the time spent at an aerodrome is reduced to a minimum, also the machines in turn reach the headquarters at Toulouse and Buenos Aires, where they can be overhauled.

At Toulouse the major repairs and overhauls are done under the supervision of the Société Industrielle d'Aviation Latécoère. At Buenos Aires the workshops belong to the Company, who do complete overhauls of engines and aircraft there. There are small workshops at Casablanca, Rio de Janeiro and Marseille.

All aerodromes along the route are equipped for night flying. Red ground beacons are placed 30 cm. (12 inches) above the ground and all obstacles are similiarly lit. Mobile searchlights are used for flood-lighting, these are mostly of the Brandt and Fouilleret type.

Each aerodrome has a beacon with a 3,000 watt lamp and normally can be seen from 100 km. (62 miles). A small flashing light on top of the beacon indicates the name of the aerodrome. The full organisation for night-flying requires beacons between the aerodromes, and such beacons are now being made. The route from Bordeaux to Toulouse, at Perthus, at Tangier, and at Casablanca is already equipped.

M. Grimault claims that the wireless service of the Company is the most efficient private service in existence. It has been organised to provide constant communication between the aerodromes, to enable pilots to keep in touch with the aerodromes and ultimately with one another, to enable pilots to navigate by directional radio and to allow the marine organisation and the ground staff to keep in touch with the seaplanes on the Tangier route.

Each aerodrome has a transmitter for short and long wave working (15 to 60 m., and 400 to 2,000 m.). The power varies from 100 to 1,000 watts on the aerial. Each aerodrome also has a receiver with a range of wave-length from 15 to 3,000 m. This receiver will also receive directional radio signals on wave-lengths from 200 to 3,000 m. In addition each aerodrome has two small-range receivers, one short and one long wave, for emergency help calls.

Certain other wireless stations besides those owned by the Company are used for the directional radio system. The service is done by telegraphy on continuous or interrupted continuous wave.

The powers of the transmitting apparatus carried on the aircraft ranges from 50 to 150 watts, the receiver uses from four to seven valves. Current is obtained from a wind-driven generator which supplies three voltages. The transmitter is arranged to work from the ground in the event of a forced landing.

The air fleet of the Company numbers about 100 of the Latécoère 25 and 26 types, and 17 of the Latécoère 28 type. The number of the type 28 will shortly be increased to 33. There are ten other machines of assorted types, among which are three Potez 25s (450 h.p. Lorraine engines), which are used to cross the Andes. There are seventy machines of older types held in reserve.

The Latécoères are all high-wing braced monoplanes with duralumin wings and fuselages. The type 25 is a cabin machine and the 26 is a similar machine designed specially for postal work. The Latécoère type 28 has a total weight of 4,040 kgs. (9,000 lbs.), a commercial load of 950 kgs. (2,100 lbs.), a top speed of 238 km.hr. (148 m.p.h.), a cruising speed of 200 km.hr. (124 m.p.h.), and a range at cruising speed of 800 km.hr. (500 miles). This machine has either a 500 h.p. geared Hispano-Suiza engine or a 500 h.p. geared Renault engine.

M. Grimault drew particular attention to this machine as being the fastest commercial aircraft in use at this moment. [Exclusive, one would imagine, of American machines like the Lockheed Vega and the new Fleetster, which cruises at 150 m.p.hr.—Ed.]

The Comte de la Vaulx, President of the F.A.I., recently flew from Toulouse to Casablanca in this machine at 176 km.hr. (110 m.p.h.) including stops, or, reckoning only actual flying time, at 222 km.hr. (140 m.p.h.).

M. Grimault says that the 450 h.p. Renault engines used by the Company have flown 30,000 hours and no disaster or trouble has been caused by engine failure.

The sea-going fleet of the Company includes the six boats already mentioned, four rescue steamers of a few hundred tons each, two water-tankers, two oil-tankers, and ten motor boats. During the coming Summer four new units will be commissioned to act as tenders for the trans-Atlantic seaplanes.

The total personnel of the Company is 1,250 persons, of whom 85 are pilots, 120 wireless operators and 280 mechanics.

When the service was started, overhauls were made every 100 hours. This figure has been increased and now stands at 250. The

THE LATECOERE 28 MONOPLANE.

The Latécoère 28 is a single-engined 8-seat commercial monoplane designed and built by the Société Industrielle d'Aviation Latécoère of Toulouse.

This company is directly interested in the Cie. Générale Aéropostale which operates the Paris-Bordeaux-Toulouse, the Bordeaux-Biarritz, the Marseilles-Perpignan, the Alicante-Oran-Casablanca, and the Toulouse-Buenos Aires air routes.

This latter company has examined the possibility of an extension of the Paris-Bordeaux-Biarritz route to Madrid and the Lat. 28 has been flown experimentally over this route.

Once it flew from Paris to Madrid a distance of 1,200 kms. (746 miles) non-stop in 5 hours 11 mins. at an average speed of 230 km.p.h. (143 m.p.h.). Another time it flew from Paris to Biarritz in 3 hours at an average speed of 233 km.p.h. (145 m.p.h.).

The obvious difficulty about this route is getting over the Pyrenées, which more often than not are covered in fog condensed from the warm air of the Atlantic.

Type.—Single-engined commercial and postal monoplane.

Wings.—Rigidly-braced monoplane wings, with uniform camber and elliptical wing tips. Metal construction. Braced to the fuselage by pairs of streamlined metal struts. Wings covered with fabric. Shaft control of ailerons.

Fuselage.—Of metal construction in two sections. The forward portion, the engine mounting, is metal covered. The rear section is covered with fabric.

Tail Unit.—Normal monoplane type with metal frame, covered with fabric.

Undercarriage.—Divided type with wide track. Each half has a Vee hinged to lower longeron of fuselage with a vertical shock-absorber attached to the front lift bracing strut, which is highly stayed to the centre of the fuselage Wheel-brakes are fitted.

Power Plant.—One 500 h.p. Hispano-Suiza (or Renault) water-cooled engine, with 2/1 reduction gear. Retractable radiator in bottom of fuselage. Petrol pumps are used to supply the carburetter. A metal airscrew is used.

Accommodation.—Enclosed pilots' cockpit with double control and wireless. Droppable petrol tank, cabin for eight passengers, with ventilation, heating and openable windows. Lavatory accommodation and baggage compartment aft of cabin.

Dimensions.—Spar 19.25 m. (60 ft.), Length 13.5 m. (44 ft. 3 in.), Height 3.6 m. (11 ft. 10 in.), Wing area 48.6 sq. m. (520 sq. ft.).

Weights and Loadings.—Weight empty 1,690 kgs. (3,720 lbs.), Weight of fuel 480 kgs. (1,050 lbs.), Pay load 950 kgs. (2,100 lbs.), Weight loaded 4,040 kgs. (9,000 lbs.), Wing loading 82.3 kgs./sq. m. (17.8 lbs./sq. ft.), Power loading 8 kgs./h.p. (17.6 lbs./h.p.).

Performance.—Maximum speed 238 km.p.h. (148 m.p.h.), Cruising speed 200 km.p.h. (124 m.p.h.), Climb to 1,000 m. (3,280 ft.) 5 min. 21 sec., Climb to 2,000 m. (6,560 ft.) 11 min. 16 sec., Ceiling 5,600 m. (17,000 ft.).

THE LATECOERE 28.—An eight-passenger cabin monoplane (600 h.p. Hispano-Suiza engine) now used by the Cie. Générale Aéropostale.

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overhauls are mostly the cleaning of the engine or the replacement of minor parts. Many of the engines have flown more than 600 hours without requiring attention to the cylinders or crankshaft bearings.

Castor oil is used, as the mineral oils which have been used up to date form tar and soot up more rapidly than castor oil, which is also cheaper throughout the routes.

The aircraft used in the Sahara and in the tropical climates have the fabric replaced about every 500 hours.

The departure from Buenos Aires is made regularly at midnight and, on the average, each service to America does from 10 to 20 hours of night-flying, which means nearly 10,000 hours per year.

The saving of time over the normal mail route is considerable, the air mail reaches Santiago in eight and a half days from Paris as against the normal 25. The air mail reaches Monte Video and Buenos Aires in seven and a half days as against 18.

The average time from Natal to Buenos Aires is 47 hrs. 30 min., and the best time in Summer is 31 hrs. 25 min. From Toulouse to Dakar the average time is 40 hours and the best 27 hrs. 15 min.

On the route from Natal to Buenos Aires the percentage of scheduled departures has been 94, and the percentage of arrivals less than 48 hours late, has been 82.

On the Toulouse—Dakar section the corresponding figures have been 100 and 90.

	1928.	1929.
Weight of postal matter carried between France and S. America	2,732 kgs.	8,943 kgs.
Total postal matter on all services ..	82,610 kgs.	84,040 kgs.
Freight	17,470 kgs.	28,602 kgs.
Passengers	870	1,116

The total receipts in 1929 were 18,524,929 francs (£148,000) of which 16,881,789 francs (£136,000) was for postal services. The service between France and America receives a subsidy of 10,653,094 francs (£86,000).

The Atlantic will have to be flown non-stop as the Cape Verde Islands have no sheltered roadsteads for seaplane take-offs nor are Saint Paul's Rocks nor Fernando de Noronha any better. The Company are therefore having constructed fast postal seaplanes of ten tons total weight with a range of 4,000 km. (2,500 miles) and commercial load of 500 kgs. (1,100 lbs.). These machines will be ready during 1930.

Bigger machines which are now being built should enable 1,000 kgs. (2,200 lbs.) to be carried the same distance and then Buenos Aires will be within five days of Paris.

M. Grimault closed his paper with a short description of the line between Marseille and Algiers. Over this route six trips in each direction are made weekly. At the end of the Winter and during the beginning of Spring sudden and violent storms make the operation of the route over the Mediterranean particularly difficult.

The Company has five Cams flying-boats and four Latécoère seaplanes for use over this route. The Cams have 500 h.p. Hispano engines or 480 h.p. geared Jupiters. Their all-up weight is 6,500 kgs. (14,300 lbs.) and their commercial load is 300 kgs. (670 lbs.). Their top speed is 205 km.hr. (127 m.p.h.) and cruising speed 155 km.hr. (96 m.p.h.).

The Latécoère 32s have 500 h.p. Hispano engines and have similar top and cruising speeds, and commercial loads, to the Cams. Their all-up weight is 7,500 kgs. (16,500 lbs.). The crew are one pilot, one wireless operator and a mechanic.

The average time for the journey is five and a half hours and the quickest time 3 hrs. 50 min. The percentage of departures to scheduled flights is 86 and of arrivals 80. This figure includes machines which are late but arrive on the day of departure.

The Discussion.

Colonel The Master of Sempill paid tribute to the enterprise of the *Compagnie Generale Aéropostale* which had made possible the development of this route. He asked the Director of Civil Aviation, Sir Sefton Brancker, to open the discussion.

Sir Sefton Brancker said he was very glad to welcome M. Grimault. The *Compagnie Generale Aéropostale* might be regarded as the child of the Latécoère Company, who probably operated the first air transport company in the World, for on Christmas Day 1918 they started a service between Morocco and France.

He referred to the amount of imagination required to conceive the line which now has the highest route in the World (across the Andes) and in the coming Summer will attempt to cross the greatest stretch of sea. He looked forward to the time when he would be able to get away and fly over the route of the Company to Santiago.

He said that to change machines at every refuelling point seemed a counsel of perfection; he asked what the cost was, as such a system meant considerable increase in the number of aircraft required. Refuelling, if properly arranged, should not take more than 5 or 6 minutes. [One imagines that the true reason for these short stages is the extra safety assured by only flying short stretches between thorough inspections of the engines, and changing of sparking plugs, etc.—C. G. G.]

Although he personally thought that aircraft should be kept small and have increased speed to give a faster service of increased frequency, yet ten-ton flying-boats were rather small. On distances of 1,500 miles these boats would have to use such a large proportion of their disposable load for fuel that the commercial load would not be worth while. There were no points of refuge on the crossing and that was another reason why the boats should be bigger and therefore more seaworthy.

He referred to the big flying-boats of 30 tons or so now being built in this country. Speed was a necessity and 85 m.p.h. was not enough for routes of 10,000 miles or more. At least 120 m.p.h was necessary, if adverse winds were to be met and connections made (to schedule).

Lieut. de Vaisseau Sala, the assistant Naval Attaché and Air Attaché at the French Embassy, acted as interpreter and replied for M. Grimault. He said that they had tried both using the same machine for a number of sections and changing-over at each refuelling point. The latter system had proved the best, as a change-over could now be done in five minutes. The considerably longer time to refuel totalled up to a very large figure over the whole route as there were such a number of stops.

The ten-ton seaplanes were only for the experimental working of the route and later twenty-ton machines would be used. These would carry one ton of useful load.

Mr. Handley Page said he endorsed everything that Sir Sefton Brancker had said. Referring to the question of changing-over machines, he said that if you carried more petrol than paying load it was easier to change the smaller load and he supposed that was why the mail and passengers were transferred to fresh machines.

The adverse climatic conditions made a big wireless network necessary; in this country the cost of such a system was happily met by the Government. Such a system might be compared to the signalling system of a railway, and he would like to know the cost per mile of the company's wireless system. He would also like to know the cost per ton mile throughout the system. He suggested that if all the Aéropostale fleet were assembled into one spot it would make quite a second class Air Power. [All the more credit to France, which, besides being a first class Air Power, manages to finance the World's Greatest Air Line.—C. G. G.]

Mr. Handley Page said he would also like to know the ratio of subsidy to commercial receipts. He said that if there were only 82 per cent. regularity this meant that 18 per cent. of the letters failed to arrive and he thought that this would cause a big outcry. Had the Company found any falling-off in the mails? St. Paul's Rocks were very fortunately placed and he asked whether these rocks could not be used as a foundation for a seaplane base.

He congratulated the Company on the good service achieved in spite of difficulties. The slides of the Andean valleys reminded him how Commander Dyott had once said before the Society in a paper on Flying in Peru that only a machine with a claw undercarriage could hope to survive a forced landing. [In spite of which an American air-line flies regularly from Lima over the Andes to Iquitos on the Amazon, which is the very route surveyed by Sqd. Commander Dyott.—C. G. G.]

Sir Vyell Vyvyan congratulated the Company on the way in which they had surmounted their difficulties, which were even worse than those on the way to India. He suggested that between Buenos Aires and Santiago was the most difficult part of the route. Were supercharged engines used over the highest parts? He agreed with Sir Sefton Brancker that we required faster machines. At present the average speed to India was only 30 m.p.h. He asked whether the Company did much night-flying and whether there was any tendency to separate the mail and passenger traffic.

Air Commodore Chamier, of Vickers Ltd., prefacing his remarks with the useful Eastern diplomatic phrase, "After compliments," said that M. Grimault appeared to hold a brief for water-cooled engines, whereas Imperial Airways thought of nothing but air-cooled. He gathered from the paper that night-flying was done automatically, namely, after changing machines, if the night was favourable the mail went straight on. Was this so? He pointed out that examination of the figures showed that only a very small per cent. (10%) of the mail went through to S. America. This was disappointing as one would expect the greater saving of time over the long distance to make the service more attractive.

He too would like some figures, though he knew we should not get them. He quoted figures to show that each machine of the Company need only fly once a year to carry the total pay-load carried by the Company in a year.

Major Bulman referred to the point which had been raised about the Company having a preponderance of water-cooled engines. He gathered that they had been making some tests with the Jupiter. He would be grateful to hear whether water-cooled types were used because no other type was available or because of their lower fuel consumption. At Friedrichshafen recently they told him that they had to use water-cooled engines for long range because of the lower fuel consumption. He suggested that some form of supercharging must be used to cross the Andes.

He remarked on the fact that the Company were using castor oil, whereas we after a number of tests had found mineral oil to be satisfactory, provided appropriate clearances were allowed for the reduced viscosity of such oil.

He asked whether any form of air filter was used over the desert and if an oil cleaner was used? The Company's 250 hours between engine overhaul seemed fair though we could claim better. Our ambition was to have within two years an engine for flying-boats which would run for 1,000 hours without overhaul. The question had been raised whether, as the flying-boat would have to come in for overhaul after 500 hours, the development of such an engine was worth while.

Dr. Merton raised a point in connection with directional wireless and asked, as all the stations were on the line of flight, how cross-bearings were obtained?

Mr. Radcliffe asked what steps were taken to prevent corrosion of the duralumin in the aircraft structures and if any attempt was made to make cabins soundproof.

Herr von Scherpenberg asked whether the political difficulties which arose from a forced landing among the natives along the African coast had become less?

Mr. Pye said that at the end of the War some one had got out a figure for air-miles per gallon of fuel, he thought the figure was 30,000 ÷ W, where W was the weight of the machine in pounds. This was for a twin-engined machine. Such a figure based on present practice might be useful, though the cost of maintenance might be more important than the question of fuel. He quoted 17s. 6d. per flying hour as an all-in maintenance figure for one type of engine.

He hoped that we should have some more papers like this. Future developments can only happen from results discovered by huge organisations such as the Company. Civil aviation has relied too much on the fighting services. It must have a technical development of its own. He hoped that this would be the first of a series of such papers. Everyone was impressed by the immense organisation

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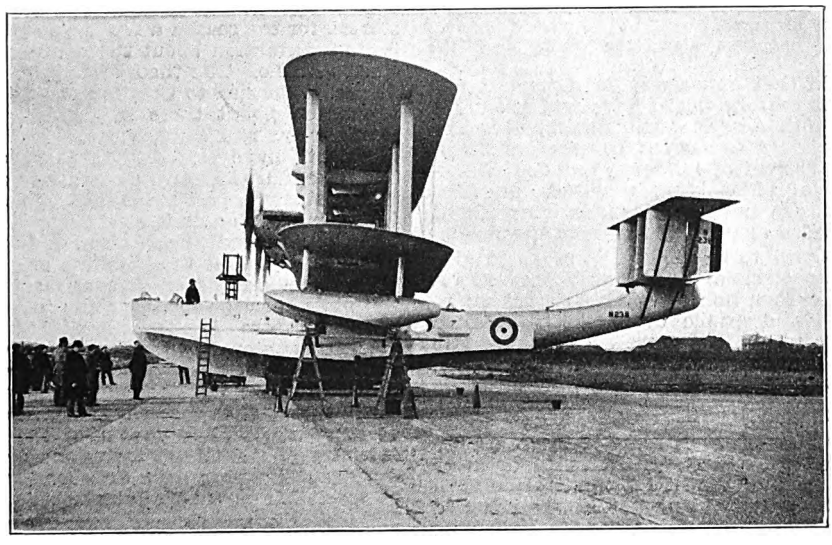

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of the Company and he thanked the lecturer for coming specially over from France to widen our horizon.

While Lieut. Sala and M. Grimault were holding what Col. Sempill called a minor Naval Conference, he took the opportunity of drawing the attention of Sir Vyell Vyvyan, a Vice-President of the Society and a director of Imperial Airways, to the remarks made by Mr. Pye. People had come over from Germany and France to tell the Society about their air transport organisations but no one would come from Imperial Airways to give such a lecture.

Lieut. Sala then replied to some of the questions which had been raised. The Company found that the price of castor oil was less throughout their route than mineral oil. Even if the price were the same they would prefer castor oil as they have found it gives less deposit and leaves the internal condition of the engine better. The Company had originally used water-cooled engines as no air-cooled engines were available. Ordinary engines without superchargers were used between Buenos Aires and Santiago.

St. Paul's Rocks and Fernando de Noronha were of no use though the Cape Verde Islands were of some use on the way back.

The figure of 82 per cent. regularity was for machines less than two days late, the percentage was nearly 100 if machines four days late were included. Sixty per cent. of the entire mail between France and Morocco is carried by air.

The mail service to S. America has been regarded as experimental but is now becoming popular. No difference is made between mail and passenger-carrying, the service is mostly for mail and so no attention has been paid to sound-proofing.

They have had no trouble from corrosion of duralumin, which is protected by the normal thin coat of varnish. A special air filter and oil centrifugal cleaner are used.

Most of the night-flying was done along the coast, using the light-houses as beacons.

[To this one may add that apparently M. Grimault was too modest to tell us all that he might have said about his line. A visitor from South America who flew by this line told one that from Buenos Aires across Uruguay to Brazil they have an excellent system of landing grounds. Warning is given by radio of night-flying machines, and the landing grounds ahead are lit up. Each remains alight till the machine is signalled as passing the next ahead.

The short stages are said to be deliberate, so as to give the engines the shortest possible run between inspections. Things shake loose after four hours which stay put up to that time. Reliability is desirable over forests infested by hostile Indians. And it is still more so over the Rio De Oro, where several pilots and mechanics have been murdered and mutilated by the local Moors.—C. G. G.]

THE WEST INDIES AND BRITISH GUIANA.

In the House of Commons on Mar. 25, in reply to a question by Commander Bellairs, the Under-Secretary of State for Air said that the Report of the 1927 Committee on Civil Air Transport in the West Indies and British Guiana had dealt only with the question of opportunities for civil aviation in the West Indies and it rested with private enterprise to come forward with proposals for making use of such opportunities as the Committee considered to exist. Certain proposals to this end had been made but had not matured owing to financial difficulties. The Secretary of State for Air was anxious to further the establishment of British civil air services in this region by all possible means so far as financial limitations permitted. American aircraft were crossing the West Indies and British Guiana in the course of air services between the U.S.A. and South America and one of the companies operated also over British Honduras.

U.S. AIR SERVICES IN BRITISH TRINIDAD.

In the House of Commons on Mar. 26, in reply to a question by Mr. Hurd, the Under-Secretary of State for Air said that the Governor of Trinidad had granted for a period of six months, subject to renewal, a special and temporary authorisation permitting aircraft of Pan-American Airways to fly over and land in the Colony on flights from the United States of America to the Colony and to South America and back. Permission to erect and operate a wireless station, to extend the jetty at Cocorite, and to reclaim a part of the foreshore, had also been given. The possibility of a British air service was being explored.

THE ACCIDENT AT LIMPSFIELD

On Apr. 7 at about 4.15 hrs. a single-engined Junkers machine which belonged to the Luft Hansa crashed between Limpsfield and Westerham, and then caught fire. The pilot, Karl Wessel, and the mechanic and wireless operator, Gustav Ferdinand Konnert, were both killed.

The machine was on an early morning goods service which started for the season a few days ago. At the moment there is no information about the cause of the accident which is at all reliable. The theory has been advanced that the pilot decided to return to Croydon as mist or fog had obliterated the beacons, but there is just as good evidence that the weather was reasonably clear.

Reports have stated that just before the crash Verey lights were fired from the machine as if the crew were trying to illuminate a possible landing place, but these stories are just as unreliable as the rest.

An experienced person who has inspected the scene of the accident says that the machine evidently hit the ground at a very steep angle of descent, as there were no marks of the undercarriage having come in contact with the ground before the nose of the machine. If this be accurate then the machine was evidently not flown into the ground, but dived into it. On the other hand, some newspaper accounts specifically mention the lines ploughed up by the undercarriage.

All these merely serve to confuse the issue and are a further argument in favour of the publication by the Air Ministry of whatever conclusions may be reached by their Accidents Investigations Sub-Committee which is composed of specialists in such affairs.

THE SURVEYORS CONTINUE.

Mr. and Mrs. Alan Butler, who left Heston Air-Park on Mar. 20, arrived at Khartum on Mar. 31. They left the following day for Malakal.

On April 5 Mr. and Mrs. Alan Butler landed at Tabora, Tanganyika.

A ROYAL PATRON.—His Majesty the King of Belgium (in gray hat and glasses) **leaving the De Havilland Hercules (Jupiters) of Imperial Airways in which he arrived from Baghdad, piloted by Major H. G. Brackley (without hat, behind His Majesty). Wing Commander Rice, R.A.F., is on the extreme right.**

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THE NEWEST AIR NAVIGATORS

The following candidates, whose names are given in alphabetical order, have passed the examination for 2nd Class Air Navigators Licences, which was held at the Air Ministry, on Mar. 24 to Mar. 26: Mr. P. Bailey, Flt. Lt. L. K. Barnes, R.A.F., Mr. F. V. W. Foy, Flg. Off. A. E. Hill, R.A.F., Flt. Lt. I. W. C. MacKenzie, R.A.F.O., Flt. Lt. M. C. Pascoe, R.A.F., Mr. P. Phillips, Miss W. E. Spooner, Miss F. M. Wood.

The subjects of the examination were:—International Legislation—Form of the Earth, Maps and Charts—Meteorology—Dead Reckoning and Direction Finding—W/T Navigation—The Earth's Magnetism and Compasses—Visual Signalling. To be successful candidates were required to obtain 70 per cent. of the aggregate marks and not less than 60 per cent. in any one subject.

MAKING FOR THE OPEN.

Air Associates Inc., who up to the present have had a first floor shop and showroom at 535, Fifth Avenue, New York, are removing all their Sales Department to their service hangar at Roosevelt Field, Long Island. Their shed at Roosevelt Field is now an authorised service station for Pratt and Whitney products, Wright engines, Ford-Stout planes, Scintilla Magnetos, Stromberg Carburetters, Eclipse Starters, the various instrument companies, and Russell Parachutes.

A FRIEND'S PROMOTION.

M. Renvoisé, who, since 1922, has been Commandant of the Civil Airport of Le Bourget, has been appointed *Sous-Directeur du Réseau Aérien de Paris*, with headquarters in the Civil Aviation Branch of the Air Ministry in Paris.

M. Renvoisé has been responsible for the lay-out of Le Bourget, and those people who remember Le Bourget as it was at the beginning of his *régime* and know it as it is today, will realise the amount of good work done by him in making it one of the finest Air Ports in Europe.

M. Renvoisé's charming personality will be missed by many British pilots, both professional and amateur. He has always been most courteous and helpful to all air travellers, and has made for himself a name that is as well-known in England as it is in France. Everyone in British Civil Aviation will wish him well in his new post.

CROYDON NOTES.

On Saturday afternoon last Croydon Aerodrome was visited by 300 members of the City Livery Club. Those of us who had been brought up in the belief that a Livery Club was composed of pop-eyed, purple-faced, old gentlemen, with bristly white moustaches and highly developed tempers, who had spent the past ten years of their lives in tropic climes, consuming paprika, chillis, curry and highly inflammable malt and spirituous liquors, to attain a sufficiently livery state to join the club, were bitterly disappointed on Saturday. Actually, the London Livery Club is composed of handsome and charming individuals, and appears to be a sort of combine of all the Ancient Trade Guilds of London.

Amongst these are such mysterious crafts as Cordwainers, Lorimers and Silver Wire Drawers, though the latter is said to have no connection with Tin and Zinc Lingerie Ltd. Anyhow, the Livery Club appears to have enjoyed itself pretty thoroughly, as no less than eight paying loads of joy-riding Lorimers, Fletchers, Bowyers and Cutlers were sent up in an Imperial Airways Argosy. The cup of happiness of these passengers, already brimming, overflowed with a considerable splash when they understood that no less a personage than the famous aviator, Capt. (temp. Major) Gordon P. Olley was to be their pilot.

A new joy-riding firm, Aviation Tours Ltd., started their campaign with something of a flourish at Oxford last week. Besides two busy Avros, they had hired or purchased a Handley Page W.8b from Imperial Airways Ltd. This seems a particularly sound move, because people in the Provinces have seen any amount of Avros and such small deer, but not very many big cabin machines. Joy-riding in so superior a commercial aircraft as a W.8b should prove a great attraction, not only at Oxford, but at most of the Provincial centres.

On Saturday Mr. McIntosh took Major Holt's 3-engined Fokker to Italy to pick up Sir Henry Segrave and Mr. Pitt, who is a partner of Major Holt.

Mr. Van Lear Black, who left Croydon Aerodrome on Feb. 9 in his three-engined Fokker, arrived at Tokio on Monday last.

A committee composed of pilots and members of the various firms on the Aerodrome has been formed to run the Pilots' Room in the Aerodrome Hotel more as a club than has been the case hitherto. Anchor Taverns Ltd. have agreed to this, and an annual subscription is to be charged. Certain classes of aerodrome employees are to be eligible for membership.

Some organisation of this sort has been badly needed for a long time and several useful reforms can be thought of at once. One is the expulsion of a certain type of person whose manners and habits are Neolithic and who usually is but remotely connected with the Aerodrome. Specimens of this unpleasant race have taken to using the Pilots' Room more and more in recent times.

The other reform is the exclusion of sweethearts, wives and such natural phenomena from the Pilots' Room. This would be a boon and a blessing to the quietly convivial-minded. The Committee will doubtless be up against criticism and grumbling from certain elements of the community, and a strong hand may be needed at times.

As, however, Lieut.-Col. Henderson is president, supported by the redoubtable Capt. Muir and the mildly ferocious Mr. Bernard Wilson, no real difficulty need be expected. Visions of President Henderson despatching Comrade Muir and Brother Wilson armed respectively with a length of lead pipe and a bottle of tartar oil in pursuit of a refractory club member should be enough to intimidate even the most inveterate grumbler. Quite seriously the formation of this Committee is one of the best things that has happened on the Aerodrome for a very long time, and we wish the Club all the success in the world.—SPRY.

THE LONDON TERMINAL AERODROME.

ANALYSIS OF FIGURES FOR PAST WEEK.

Trips per Day.—Sunday, 6; Monday, 19; Tuesday, 20; Wednesday, 19; Thursday, 18; Friday, 19; Saturday, 18.

IMPERIAL AIRWAYS LTD.:
London—Egypt—India: London—Le Touquet—Paris—Basle—Zurich: London—Ostend—Brussels—Cologne and return: Machines 40, passengers 326, freight 17½ tons. India Route: Inward, passengers 0, mail 613 lbs.; outward, passengers 0, mail 747 lbs.

AIR UNION:
Paris—London: Machines 36, passengers 102, freight 9½ tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 12, passengers 28, freight 7 1/10 tons.

SABENA:
Brussels—London: Machines 16, passengers 25, freight 3½ tons.

DEUTSCHE LUFT HANSA A.G.:
Amsterdam—London: Machines 13, passengers 24, freight 3 tons.

MISCELLANEOUS:
British machines 1, passengers 0.
Foreign machines 1, passengers 0.
Total number of trips by British machines, 41, carrying 326 passengers. Foreign machines, 78, carrying 179 passengers.

COMPARATIVE FIGURES.

Week ending April 5:
Machines, 119; Passengers, 505; Crews, 309; Total personnel, 814.
Corresponding week, 1929:
Machines, 156; Passengers, 984; Crews, 348; Total personnel, 1,296.
Corresponding week, 1928:
Machines, 134; Passengers, 813; Crews, 263; Total personnel, 1,076.
Corresponding week, 1927:
Machines, 83; Passengers, 435; Crews, 137; Total personnel, 572.
Corresponding week, 1926:
Machines, 104; Passengers, 513; Crews, 143; Total personnel, 656.
Corresponding week, 1925:
Machines, 98; Passengers, 422; Crews, 132; Total personnel, 554.
Corresponding week, 1924:
Machines, 37; Passengers, 156; Crews, 61; Total personnel, 217.
Corresponding week, 1923:
Machines, 93; Passengers, 366; Crews, 153; Total personnel, 519.
Corresponding week, 1922:
Machines, 96; Passengers, 171; Crews, 140; Total personnel, 320.
Corresponding week, 1921:
Machines, 55; Passengers, 183; Crews, 70; Total personnel, 253.
Corresponding week, 1920:
Machines, 44; Passengers, 46; Crews, 46; Total personnel, 92.

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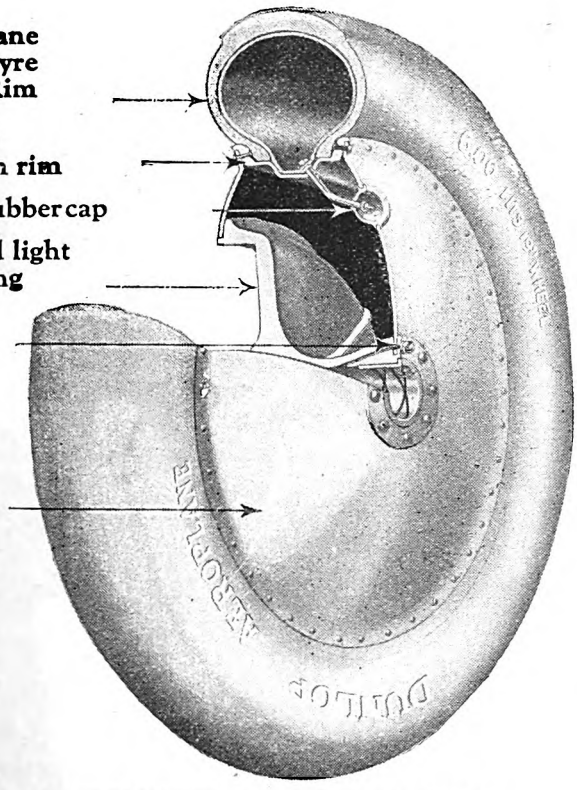

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NEW COMPANIES.

Automatic Propeller Company Limited.—Private company. Registered April 3. £2,720 in £1 shares (340 "A" ordinary and 2,380 "B" ordinary). Objects: To acquire from Victor Lougheed the benefit of certain existing inventions relating to propeller hubs for flying machines, etc. The subscribers (each with one share) are: W. Rampling, 2, Bond Court, Walbrook, E.C.4, clerk. J. Cookson, 2, Bond Court, Walbrook, E.C.4, clerk. The first directors are to be appointed by the subscribers. Solicitors: Linklaters and Paines, 2, Bond Court, Walbrook, E.C.

[This is a firm on whose developments very close watch should be kept. It is likely to have a considerable influence on flying.—Ed.]

MORTGAGES AND CHARGES.

Aero Development and Equipment Ltd.—Particulars filed of £5,000 debentures authorised Mar. 17, 1930, charged on the company's undertaking and property, present and future, including uncalled capital, the amount of the present issue being £1,000.

PERSONAL NOTICES.

Deaths.

CLARKSON.—On April 4, at 31A, Holland Street, W.8, of pneumonia, Christopher John, infant son of Christopher and Leslie Clarkson.

MARTIN.—On April 6, as the result of a flying accident on Mar. 17 at Farnborough, Sjt. John Martin, R.A.F.

Forthcoming Marriages.

COMBE—BAINBRIDGE.—The engagement is announced between Flt. Lt. Gerrard Combe, R.A.F., third son of Mr. and Mrs. Percy Combe, and Brenda Mary, elder daughter of Mr. and Mrs. Hugh Bainbridge, of Killeen, Lakeside Road, Bournemouth West.

LESLIE-SMITH—CLARK.—A marriage has been arranged, and will take place at Ottawa, on April 17, between John Leslie-Smith, M.C., B.Sc., attached to the Air Ministry, Ottawa, Canada, and Dulcie, elder daughter of Mr. and Mrs. P. Irwin Clark, of Broomleas, Budleigh Salterton, Devon.

WEST—McLACHRAN.—The marriage will take place on April 22, at St. Jude's Church, Hill Street, Birmingham, of Flt. Lt. R. W. Gordon West (R.A.F., retired) and Mrs. McLachran, of 50, Margaret Grove, Harborne, Birmingham.

Marriage.

CARTER—MacANDREW.—On Mar. 20, at St. George's Church, Moascar, Egypt, Flt. Lt. Gerald Paul Halliley Carter, R.A.F., son of Mr. and Mrs. W. F. Carter, to Esther Mary Douglas, daughter of the late Major-General Sir H. J. M. MacAndrew, K.C.B., D.S.O., and of the late Mrs. MacAndrew.

Birth.

RHODES.—On April 4, at Grantham, to Marjorie, wife of Sq. Ldr. G. C. Rhodes, R.A.F.—a daughter.

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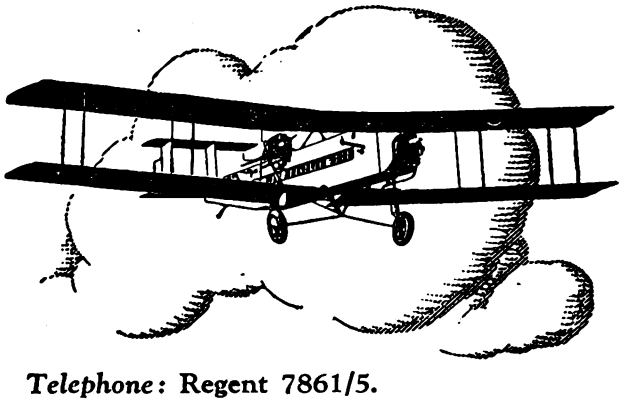
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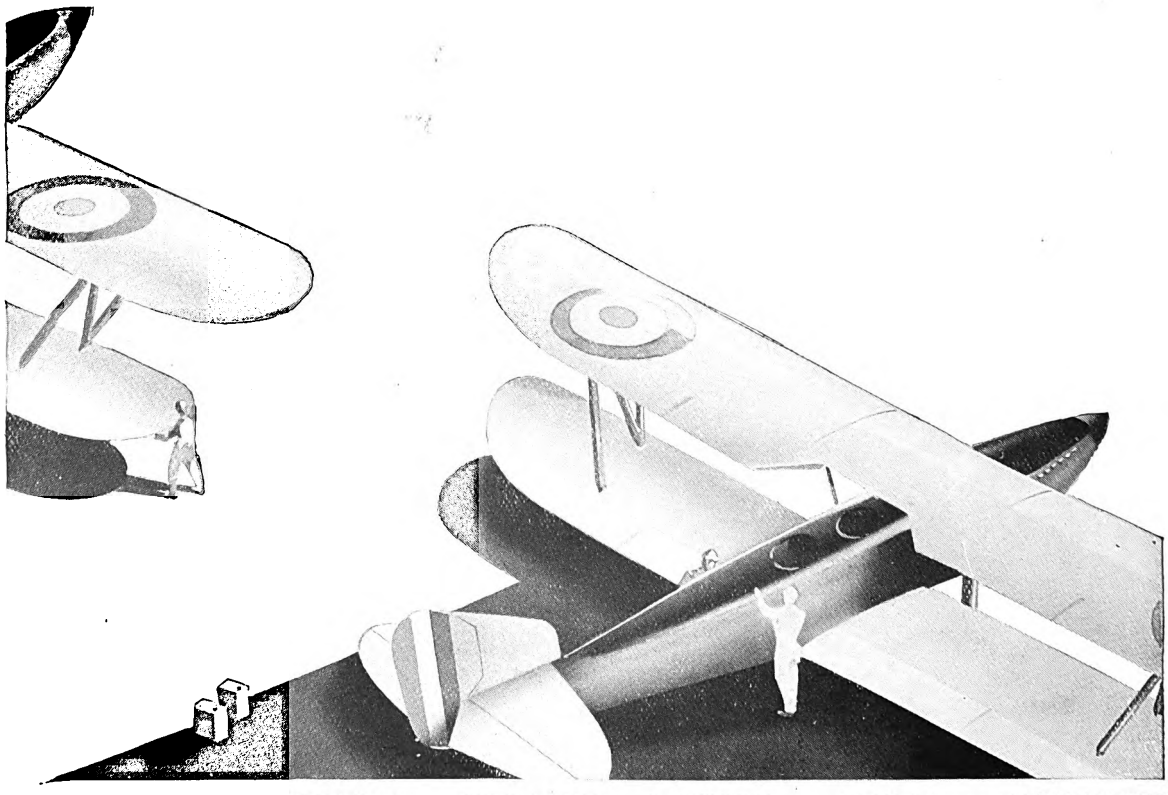

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people who have the votes. Consequently the Portuguese Flying Services seem to have suffered from a succession of what our good Mr. Montague called a "Hard-faced angel who sits up in the treasury loft."

But what money has been extracted from the Government has obviously been most skilfully spent. We were taken round the workshops by Major Cunha e Ameida, who is at the same time commanding officer and chief engineer. The shops are beautifully laid out and are as clean as our most critical engineer officers in the R.A.F. could wish. The men are largely civilian mechanics, but the soldiers of the Air Force are also trained in the workshops.

When we were there the shops were busy building a series of Vickers Valparaiso two-seaters, with Napier Lions, and a number of Potez two-seater general-purpose machines under licence to the French firm, and they were also building Bristol Jupiter engines under licence to the Gnôme-Rhône firm. The work is done as well as anybody could wish. One feels sure that if Mr. Roy Fedden of the Bristol Company had time to go and look at his Jupiters being made at Alverca he would be quite satisfied with the workmanship which is being put into them.

The workshops are equipped with the most modern machinery. But sad to say, it is all either French or German or American,—with the exception of one big lathe which bore the name of a Coventry maker,—evidently our machine-tool people have never been to look for trade in Lisbon.

Besides the workshops, the station has a beautifully equipped experimental laboratory, and excellent drawing offices and design department, in which young and obviously highly intelligent men of our own University type are employed on the higher technical side of aircraft design and construction. Some of our designers who have to work in some of the older factories would be delighted with the conditions under which the people work at Alverca.

Besides the purely technical departments and workshops, the station has an Officers' Mess and a Headquarters Office which would turn any R.A.F. officer green with envy. They are pleasing to the eye outside, and they are exquisitely, though not expensively, equipped inside. And in addition, there is a little hospital with an adequate number of beds for any reasonable number of patients in a small flying force such as this, and an operating room, itself as perfectly equipped as everything else in the place.

One gathers that the general lay-out of the station at Alverca and its equipment is largely due to the work of Captain Carlos Beja, an engineer officer of the Headquarters Staff in Lisbon, who has spent many years studying aeronautical engineering in France and Germany. Major Cunha e Ameida, already mentioned, has likewise spent much time, a great deal of it his own private time when on leave, studying aviation and the engineering side in foreign countries. And to these two officers the highest credit is due for having produced such a highly efficient and well-organised station under such difficult financial circumstances.

There is a good deal of satisfaction to be got out of the fact that in their task they are helped considerably by Vickers Ltd., who have supplied much material to the Portuguese Army.

While at Alverca, we were introduced to a Junkers monoplane with a Jupiter engine in which Colonel Cifka Duarte and another officer propose to fly across the Atlantic by way of the Azores. The machine is of the same type as the *Bremen* which, so far, is the only aeroplane which has crossed the Atlantic from East to West. Everybody will wish these two officers success in their bold venture.

In every way one was immensely impressed by the Portuguese Military Aviation Service. Apart from the Alverca Station, which will always remain in one's memory as an example of an Air Station as it ought to be, one saw a great deal of the Portuguese military aircraft in the air. One morning, 12 machines in very good formation came over Lisbon when the visibility was none too good because of low clouds. On other days one saw Avros from Amadora flying around casually over the rocky and tree-clad hills about Sintra.

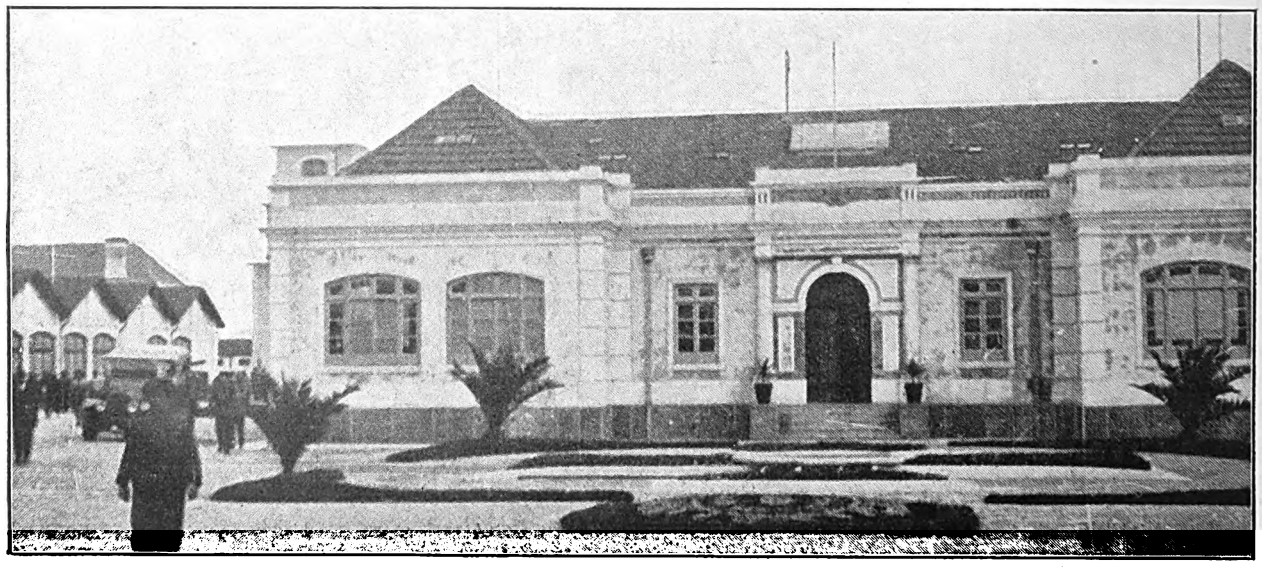
THE COMMANDING OFFICER.—Major Cunha e Ameida, in charge of the Alverca Air Station.
—("*Aeroplane*" *photograph.*)

The amount of flying done is large, and the flying is of high quality. And whenever a military machine has a crash, which is naturally fairly often considering the ancient types of machine and the quality of the ground on which the pilots have to make their forced landings, the Lisbon papers all cry out. But when such a thing happens there is no reproach against the engineer officers who are responsible for the equipment of the military air service nor is there any reproach against the pilot, for their officers and mechanics do their best with the materials available and the pilots handle the machines skilfully. The difficulty is purely financial.

Naval Aviation.

After having seen the chief Military Air Station, naturally one went to see the chief Naval Air Station. This is on the banks of the Tagus, at the harbour of Bom Sucesso. The harbour is so called because it is that from which Vasco da Gama began his great success,—the historical voyage to the East Indies. It is close alongside the Belem Tower, a quaint and rather beautiful square tower-fortress built somewhere about the 15th or 16th century in the middle of the river to keep the Dutch from raiding Lisbon.

The Air Station, which is commanded by Lieutenant Pedro



HEADQUARTERS.—The Administrative Offices at the Alverca Air Station with a corner of the Workshops on the left.—("*Aeroplane*" *photograph.*)

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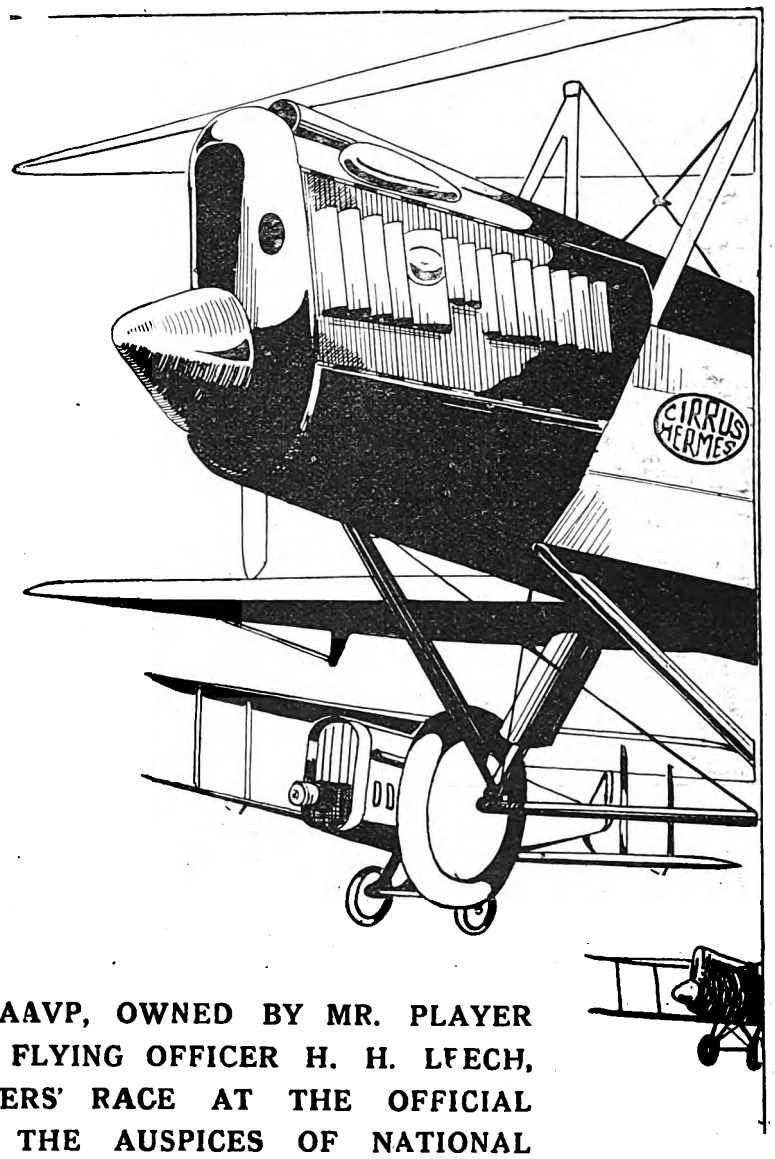

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THE FIRST ACROSS.—Admiral Gago Coutinho and Commander Sacadura Cabral, the first aviators to cross the South Atlantic by air.

that one's utter ignorance of Portuguese prevented one from hearing the jokes. But one gathered that they were much on the lines of those which one would find on a Royal Air Force Coastal Station any time when naval officers were being put through it. There was, one gathered, some question about whether a Naval officer cared to go up with a pilot who had only just taken his Aviator's Certificate, and whether if he did go up with him, he would mind much if the aviator practised doing a few loops in a flying-boat. The young naval officer looked as amiable as could be expected under the circumstances.

The whole atmosphere of the station was thoroughly cheery and thoroughly full out, and obviously it is what in our Navy we call "a happy ship." Lieutenant Pedro Rosado is to be congratulated on his command, and the officers and men under him are to be congratulated on their commanding officer.

Good Success Again.

The seaplane station at Bom Sucesso has justified its name in aviation as it justified its name nearly 500 years ago as a seaport. From it, Commander Sacadura Cabral and Captain Gago Coutinho started in their Fairey seaplane (Rolls-Royce Eagle engine) on their great voyage which ended in their becoming the first men to fly across the South Atlantic. The old machine on which they completed the voyage, called the *Santa Cruz*, still hangs in the main seaplane shed at Bom Sucesso as a memorial of the feat, after having done several years' service since then at Macau, the Portuguese colony in China.

There is a monument on the station which commemorates this great voyage, though it was actually erected to commemorate the gallant pilot who made the voyage and was afterwards lost at sea, flying from Holland to Portugal. This monument to Commander Sacadura Cabral appears herewith. It is one of the most beautiful pieces of work of its kind that one has seen, and the pity is that it should be placed between two blocks of buildings on the quay instead of being placed out in the open on the pier-head, where it could be seen by everybody coming into or out of the harbour as well as by people on the shore.

Portugal's Navigator.

This famous flight to South America, which fully deserves to rank with the great flights by the Portuguese navigators in the fifteenth century as an example of skill and bravery, is the more remarkable because the second member of the crew, Captain Gago Coutinho, was already over 60 years of age when he made the journey. Captain Coutinho was then already known as one of the greatest scientific navigators, and he had taken an interest in aviation from its earliest days.

He thought himself too old to be a pilot, but he flew as a passenger and soon discovered that even the finest of pilots in those days knew nothing whatever about actual navigation out of sight of land. Consequently he set to work and designed a special form of sextant for air navigators. This instrument, now known all over the World as the "Coutinho Sextant," is, one is told, quite amongst the best instruments of its kind produced in any country. Also Captain Coutinho, who has since been deservedly promoted to the rank of Admiral, has written a treatise on "Air Navigation in Commercial Service to South America," which is recognised as the standard work on the subject.

Admiral Coutinho has also written a vivid account of his voyage across the Atlantic with Commander Sacadura Cabral. And with it, he has given all the navigational details and the system on which he worked out his course across the South Atlantic.

Next week one hopes to discuss Admiral Gago Coutinho's ideas, based on his personal experiences, of how the air-mail lines across the South Atlantic should be run.

(To be continued.)

THE BRITISH SCIENCE GUILD.

The British Science Guild announce that the Right Hon. Sir Samuel Hoare, formerly Secretary of State for Air, has accepted nomination as President of the British Science Guild in succession to the Right Hon. Lord Melchett.

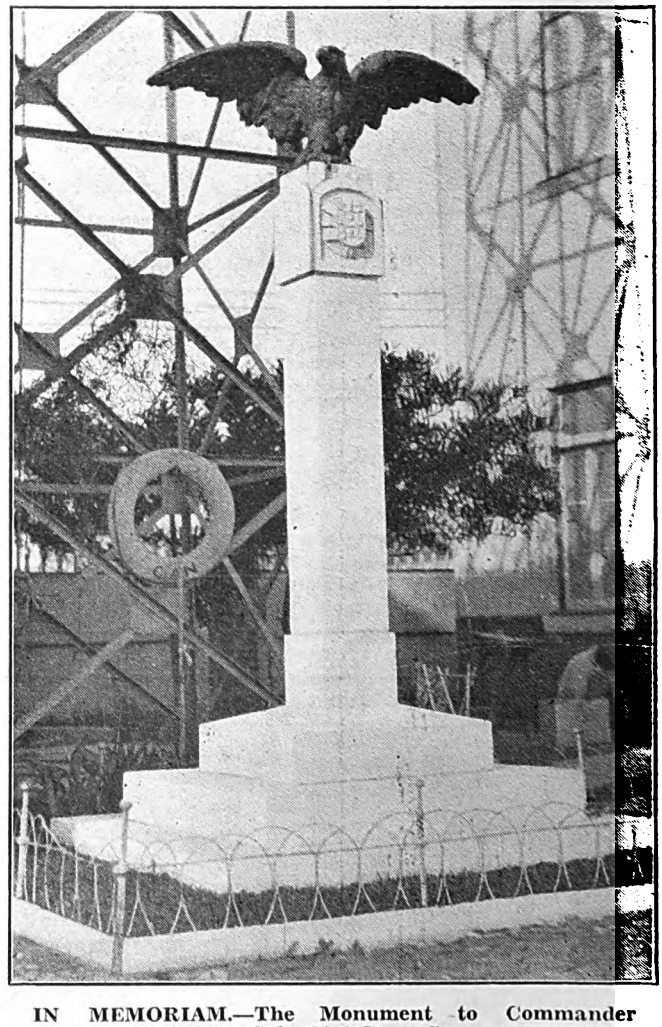
The election of Sir Samuel Hoare will take place at the annual meeting of the British Science Guild in the course of a few weeks.

THE I.C.A.N.

As from Apr. 15, this year, the seat of the International Commission of Air Navigation will be 15 bis, Rue Georges Bizet, Paris (16eme), instead of in the Avenue Kléber. The telephone number is still Passy 37-34.

A SPORTSMAN'S MEMORIAL.

Brigadier-General Sir Alexander Hore-Ruthven, Governor of South Australia, on Apr. 13 presented a cot to the Children's Hospital, Adelaide, in memory of Captain the Hon. Hugh Grosvenor, who was killed on Jan. 7 while flying over Hobson's Bay in the Wackett Widgeon. The cot has been endowed by public subscription.



IN MEMORIAM.—The Monument to Commander Sacadura Cabral at Bom Sucesso.

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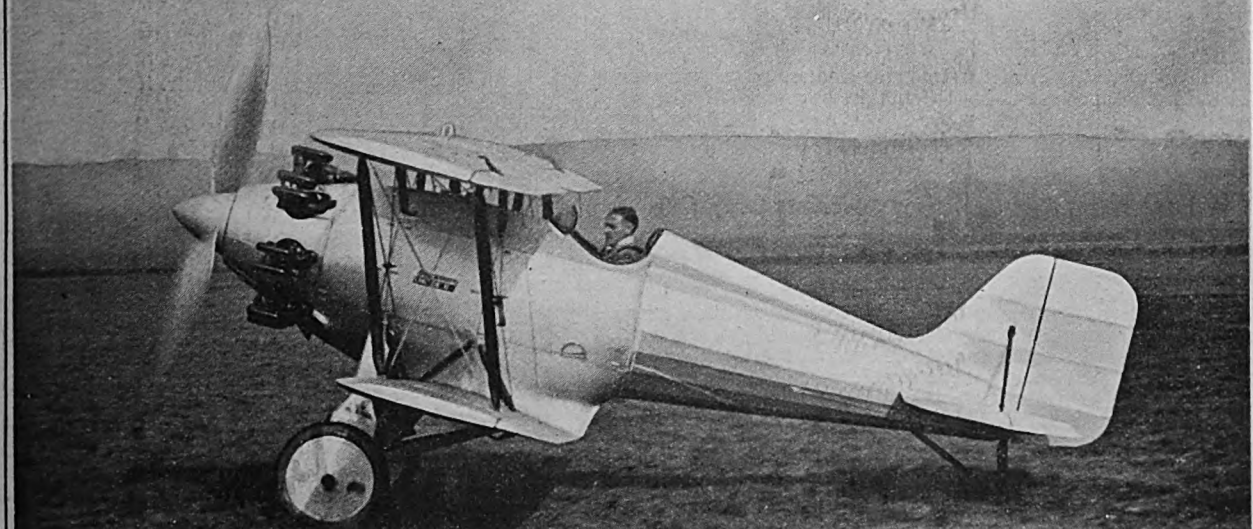

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THE HOUSE OF LORDS ON AIR POWER.

In the House of Lords on April 9 Lord Trenchard rose to call attention to the development of Air Power, and, having regard to the importance of an adequate and efficient Air Force to the British Empire and its proved efficiency and economy as an instrument of control in the Middle East, to ask the Government for a statement of their policy; and to move for papers.

The Noble Lord said:—

My Lords, it is with great diffidence that I rise to address your Lordships for the first time, and I would ask you to forgive me in advance for my many failures to express myself clearly, for I know well my limitations as a speaker. Another point that worried me considerably was whether I was right to ask this Question at all in your Lordships' House, but, after twelve years in Whitehall, I cannot help knowing the great interest that your Lordships' House has always taken in matters of Imperial Defence.

There have been many among you who have had very distinguished careers in the Navy and the Army, but I am the first humble representative of the Air Service to come amongst you, and therefore I thought that I ought to say what it is that the Air Force have been thinking and working for during the last ten years.

In asking the Question which stands in my name, I thought it my duty to point out the rapid increase in the size of the Air Forces of Foreign Powers, and to state how, since the War, the Air Service has developed. Recently the Under-Secretary of State for Air, Mr. Montague, in another place, stated that the first line strength of the Great Powers was as follows: France had 1,300 first line machines, Italy had 1,100, the United States of America 900, and Great Britain 770; this means that we are fourth.

Surely that is a fact that demands very earnest consideration, if we are already becoming, and have indeed, already become, as dependent for our very existence on the Air Service as we have been in the past, and still are, upon the Navy. I feel that this is a subject that wants careful watching, and I would ask the Noble Lord, the Secretary of State for Air, what is the policy of the Government with regard to this matter at the present time, and particularly with regard to the Home Defence Force that was sanctioned after many months' very exhaustive inquiry in 1923 and has been endorsed by three successive Parliaments? Is that Force going to be continued? I feel certain that, so long as the Noble Lord, Lord Thomson, is Secretary of State for Air, he will be no party to one-sided disarmament.

To leave that side of the question for the moment, and to turn to the second part of my Question—namely, the efficacy and economy of aircraft as an instrument of control in Middle Eastern theatres—I cannot deal with this point without touching briefly upon air development since the War.

I hope that I shall not trespass too much upon your Lordships' patience if I try to explain how the Air Service has developed. It is a very big subject, and I cannot touch upon a large part of it in a short statement to-night. I shall not touch upon civil aviation at all.

I feel certain that Noble Lords will agree with me that the pilots and mechanics in the last War built up the finest air fighting machine in the world. It was built up to deal with the enemy's Air Force. British characteristics were given the fullest play and the result is the Air Force that you see to-day.

But when the War was over the question at once arose of how to organise the Air Service for peace. It appeared to those with whom I served and worked in those days that the Air Service had been developed with a single eye upon dealing with the threat of an enemy Air Force. It was clear to us that, if this was the only way in which we could use the Air Service—namely, against an enemy Air Force—then, during the long years of peace, we should be superimposing expenditure for the Air Service on the already heavy expenditure for the Navy and the Army at a time when the financial burdens of the country were well-nigh insupportable.

Those under whom I worked felt that, unless the Air Force could be used in other directions, this expenditure would be the last straw. We considered, therefore, whether the Air Service could take over—as it would have to do in order to justify this enormous expenditure in peace—some of what I might call the humdrum responsibilities of peace that the Navy and Army had performed for so many hundreds of years.

If we had no responsibility in peace, all the expense of the Air Service would be simply added to the expenditure on the Navy and the Army. How was the Air Service to be developed to take over those humdrum responsibilities?

Mr. Churchill, who was Secretary of State for Air immediately after the War, said that the Air Service must accept in peace some of the responsibility of trying to keep the peace in countries and in waters that had been patrolled in the past by the Navy and the Army, and that, if it could not do so, it would not be bearing its fair share of the burden of Imperial defence. At the same time he proposed that the Air Service should be responsible for keeping peace and order in what was then known as Mesopotamia.

The Air Staff willingly accepted that responsibility. Why did we accept it, and why did we think that we could possibly succeed? We thought that, if full use were made of the mobility and the moral effect of the Air Force, it could keep order in these wide spaces of the British Empire. I would ask your Lordships to remember that outside Europe the Empire consists of very wide open spaces.

We thought that, if mobility in the air were fully used and if a rising took place 200 miles away, instead of having to take weeks, if not months, in organising and getting to the seat of the disturbance a ground force, within perhaps two hours aeroplanes could be there. There would be no vulnerable lines of communication to attack; there would be no convoys to cut up; there would be no railways and roads to make; and that is what we mean by using to the fullest extent its mobility.

In operations by ground troops in these open spaces—I do not want to weary your Lordships—my experience is that in these countries the native knows every inch of the country, and can take the fullest advantage of the fact. He is armed and equipped probably with a rifle as good as our own, and can inflict a great number of casualties and cause great delay and great expenditure.

I will leave the question of mobility and come to the moral effect of using the Air Force. The natives of a lot of these tribes love fighting for fighting's sake, and for the sake of the glory and loot. They have no objection to being killed, some of them, if they can kill you and take your rifle, and, it may be, some domestic article like your boots, but they do not like fighting if they may only lose their boots and have no chance of getting yours.

If I may, I will put it in another way. Many of us would not mind betting half-a-crown if we have a chance of winning the other man's half-a-crown, even if we run the chance of losing our own, but very few of us will bet sixpence if we have no chance of winning the other man's sixpence and may lose our own sixpence.

It reminds me of a story of actual fact that happened to me in one of these countries some years ago. A tribe had risen and caused a good deal of disturbance. An expedition, of which I was in charge, was sent to restore order. When we got close we received a message sent in by a native, saying: "If you will leave behind the gun that pumps fire I will fight you. If you bring it I will not." The gun that pumped fire was a Maxim. We took that gun, there was no fighting, no casualties, and the tribe came in.

This may sound unsporting or unfair, if you can use such a term as unsporting in such circumstances, but I submit it is not so. If you are going on equality of armament, then we should have given up our rifles and guns at Omdurman, and used spears. It is only just to your own side and others if you can stop fighting by being better armed, or armed with a different weapon, and surely we should do it.

What the Royal Air Force have felt for some years is that if the Air Force is used quickly and rapidly, and a disturbance occurs a long way off, and an aeroplane is sent rapidly, there may be no need of dropping one single bomb. The mere presence of the aeroplane, owing to its moral effect, is sufficient. I sometimes feel it would have the same effect as among more highly civilised people if one man had a revolver in each hand and the other had not. The unarmed man would submit without a fight.

The Air Force feel that if we could use the air in these far-off distant places quickly, it might stop trouble, instead of having to wait for months while a ground expedition is prepared; and I have known the weeks and months that such an expedition has sometimes taken to prepare. I believe that in 90 per cent. of the cases in which the air has been used in the last eight years no bombs have been dropped. I would ask if it is not possible for the Secretary of State for Air, Lord Thomson, to give us some information as to the number of cases in which the mere appearance of the aeroplane has done the work.

This brings me to another side of the question, that of humanity. For twelve long years we have often been told that it is a most inhuman weapon, but is it? After the few points that I have tried to indicate to your Lordships, is it inhuman? If a column goes out to restore order with its long lines of communication it is likely to have a number of little scraps, and to be continually fighting. It has sometimes to burn villages. Does the Air Force do any worse? I am not saying for one moment that we are

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exactly on the same plane, but I say that the weapon by its very nature does not kill so many people.

A large number of people think it is quite true that if Olympia were full of people and a bomb were dropped it would create horrible casualties. There would be created worse casualties if Olympia were fired at by a gun under the same conditions. I submit that the Air Force is not more brutal than any other form of warfare, and all warfare is brutal.

May I give your Lordships a few incidents without wearying you? I know with regard to India that the question has chiefly to do with the Government of India, but I hope that the Secretary of State for India may be told by Lord Thomson about these remarks.

There were some air operations on the frontier of India in 1927, carried out in the Mohmand country. In 1908 there were similar operations in the Mohmand country. In both cases a leader appeared preaching a Jehad against the English and raising lashkars to fight.

In the 1908 operations, owing to the unrest and threats on the Indian frontier, columns had to be organised, and this tended to harden the tribes against us—they suspected an invasion; whereas in the 1927 operations there was no movement of troops with the exception of a column which was at Shabkadr in case the air operations failed, as they had not got the faith in the air which I think they have now.

In the 1908 operations a column had one month's marching in enemy country to achieve its objective. In the 1927 operations air obtained the same results in two days.

Our casualties in 1908 were 52 killed or died of wounds, 205 wounded, and 185 horses killed. The enemy losses are believed to have been about 450 killed. I am not counting the large number of sick and cholera cases, which practically never occur in any air operation. In 1908 the column had to make a circuitous march through the country and burn villages and large stocks of supplies. In 1927 we had no casualties, and we believe that the enemy's were very small—in the neighbourhood of forty or fifty.

The Mohmand operations in 1908 cost 1,800,000 rupees against 23,000 rupees in the air operations of 1927—roughly eighty times as much.

There have been many similar cases. I would ask the Secretary of State for Air whether he could not give us the cases in which in the last five years the air has been used on the Frontier, and what it cost, and compare it with five years either immediately before the Great War or when air was not used to this extent.

I turn for a moment to 'Iraq. My right hon. friend Sir Samuel Hoare in another place gave full details about 'Iraq in the discussion on the Estimates, so I will not labour that at any length. But when that question was discussed at the Cairo Conference in 1920 or 1921 it was estimated that the defence scheme would have cost something like £10,000,000 per annum. The air scheme, on the other hand, was estimated to cost only £4,000,000, with a promise of an early reduction.

The actual cost to-day is £1,500,000, and, though I have seen this amount queried, if Sir Samuel Hoare's figures were correct, it includes the whole cost of the Service in 'Iraq, including money given towards the 'Iraq Army. Every figure stated in the other House was correct in every detail.

A year ago there were many troublesome times in the Southern Desert with the Akhwans, and the whole desert was in danger of rising. In fact, some of the telegrams prophesied that there would be a Jehad rising against the British. During those operations the squadrons engaged did 6,000 hours' flying and carried 450 tons of stores to the advanced desert bases, where armoured cars, or other cars, could not go owing to the soft sand.

I would ask you to picture what it would have meant to subdue that rising if it had not been possible to use the air. It would have most likely meant building a railway in the desert, as we had to do for Khartum, and would have taken months or years.

Again, quite recently there were 7,000 troublesome tribesmen who had been in rebellion and had been raiding us. They invaded 'Iraq and Koweit, and there was serious danger of a conflagration that we could not really set bounds to; the whole centre of Arabia might have risen. By air action and the threat of air action the loss was only two camels, and the whole of the 7,000 surrendered to the Air Forces.

One other short case. Take Aden. Aden is an awful country, an impossible country. The climate is very bad. There were two battalions and a flight of aeroplanes there, shortly increased to a squadron. The Imam had invaded the Aden Protectorate to a depth of forty miles, and captured a place called Dhala and strengthened the fort there enormously. He mercilessly persecuted the tribes, which were nominally under British protection. For eight years this went on, for eight years these tribes asked for relief, and they got none. It was asked how it could be dealt with.

I saw it was stated in the other House the other day that, without the use of Air Forces, it would have cost £6,000,000 to £10,000,000 to turn the Imam out. The sickness would have been very great, and it would have taken a long time, and probably several battalions of infantry. The affair was handed over to twelve young officers of that squadron, and the two battalions were relieved, and they left before the completion of the operation. And I think I am right in saying—the Secretary of State for Air can tell us—that within six weeks the Imam was out of Aden.

There was nobody killed on our side, except one man by accident, and only about twenty on the other side. The cost, I believe, was about £8,000, and the Iman has never crossed the border again.

There was the case of the Mad Mullah of Somaliland. In the early days when I joined the Service we were fighting against him every other year. At long last aeroplanes were sent against him, and now the Mad Mullah has vanished for ever.

I would ask the Secretary of State for Air this question: Is it not possible to have an inquiry and to see what other humdrum responsibility in peace time we can take over? I may be prejudiced and entirely wrong, but is there any harm in inquiring place by place and seeing which is the most economical means to employ, both in money and in life?

I am not one of those, however much I may be accused of it by my friends, who want to do away with Army or Navy. Far from it. The idea is absurd. But I do say that we should investigate and find out what other humdrum responsibility the Air Force is justified in taking over in peace time.

What about the frontier of India? What about the Persian Gulf, the Red Sea, the Sudan, and other places? All I say is that if after inquiry it is found that one of two points is not satisfied, then there is no justification to make any alterations in the existing system. Those two points are—if the Air Force can do it more efficiently for the same money, or as efficiently for less money.

If neither of those two points can be met in any one case, I for one do not want to press for the Air Force to take over the duties, because I am really thinking of the efficiency of defence as a whole. I hope I have not wearied your Lordships. I beg to move.

Admiral of the Fleet The Lord Beatty said that if the R.A.F. would take over the duties now performed by the Navy in the Persian Gulf and Red Sea there would be great rejoicings in His Majesty's Navy because these were places, above all others, in which they did not wish to serve. Duties in these waters, however, were principally concerned with the suppression of slave traffic and arms traffic and could only be controlled by naval forces. Dhows had to be stopped, boarded, examined, and if guilty, towed into port. A flying-boat could not do this work without risk of grave damage or destruction.

Another duty of the Navy was to look after the Resident or the political representative. A flying-boat could carry him about quickly but it could not accommodate him.

A very important service performed by His Majesty's Navy consisted in the exchange of courtesies, hospitality, receiving the authorities on board and obtaining their goodwill as well as impressing them with a sense of the power of the British Empire. Flying-boats and aircraft could not exist in the Persian Gulf without having ships to assist them, therefore no economy would be gained.

Operations necessitated a ship remaining for a period of weeks at a port where trouble was likely to occur. The actual presence of a sloop had, on occasions, prevented a disturbance from arising. For nine months in the year the weather conditions in the Red Sea and in the Persian Gulf were such that flying-boats could not alight upon the water.

General The Earl of Cavan said that he thought that a question of pure strategy such as this should have been submitted, first of all, to the Committee of Imperial Defence. That then the Committee of Imperial Defence would have referred a question so closely affecting all three Services to the sub-Committee of the Chiefs of Staff and that they would have made such recommendations as they could.

The principles of Imperial Strategy were unchanged. Each of the three Services must be inter-dependent. An Army without aircraft was blind. An Air Force without an Army was unprotected and in proportion as it had to detach ground forces for its own protection by so much did it weaken itself in its proper element. And both Army and Air Forces were dependent on the sea arm.

Was it not desirable in the interests of the future of humanity that there should be at least some thought given to the mode of warfare by bombing. Bombing must be indiscriminate and casualties might be inflicted on the wrong people.

[One is amazed to see Lord Cavan bringing up such an argument as this. Are not casualties inflicted on the wrong people by long-range gun-fire? Were not civilians discommoded by his attack in the later days of 1917, when he used tanks properly for the first time in history, and made such a quick advance that his guns shelled villages in the area occupied by the Germans which had been untouched for three years? And were not casualties inflicted on the wrong people by Tilly and Wallenstein? War cannot be made simply a trial of professional skill.—C. G. G.]

The Marquess of Londonderry said that the Noble Lord (Lord

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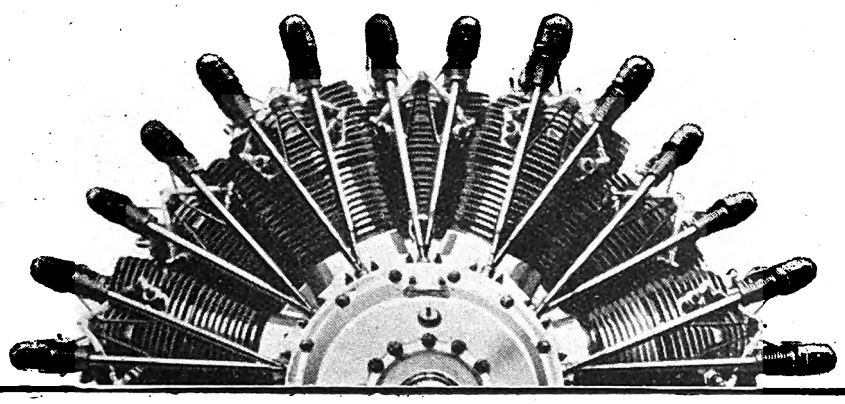

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Trenchard) who had raised the question had spoken of the formidable Air Force which had developed during the War and the speaker asked to be allowed to pay the tribute to him, which he deserved so much, of saying that it was due to his initiative and courage and to his splendid industry that we did develop that magnificent Air Force. But while his services in War were certainly second to none, his services in peace time, during the period in which he had to use all his administrative abilities, had placed the Air Force in the very satisfactory position in which we found it at the present moment.

He thought that in the very eloquent speech which Lord Trenchard had made, containing as it did so many instances where the Air Force had been highly efficacious, he had shown that the Air Force had done a great deal in bringing advantages and benefits to various portions of the Empire.

He had been much struck by the greatly increased expenditure which other countries had thought fit to make on their Air Services. The expenditure of various countries was an index which it was our duty to consider, but he did not think that this should detract in any way from the congratulations which were due primarily to his noble friend who initiated the debate and to those who had been associated with him and the Secretary of State for Air by reason of the fact that, whereas they had maintained an efficient Air Force, the expenditure of this country on the Air Force had been considerably less in proportion than the expenditure which had fallen upon other countries. This pointed very clearly to the prudent administration which had been the rule and habit of the Air Ministry for some considerable time.

He felt that in this comparatively new arm there were opportunities and activities in which the employment of the Air Force could not only save money but could be of a more humane and of a more efficacious character than if the other Services were called upon to carry out those duties.

Field-Marshal The Viscount Plumer said that in his opinion the character and nature of the Air Force did not make them the most suitable Force to perform the duties of maintenance of order and the prevention or repression of disorder in certain parts of the Empire. In the first place the Air Force was essentially an offensive force. Its power lay in its mobility and in its ability to strike quickly and strike hard. But many parts of the Empire had been and were being consolidated and pacified by a constant daily association and contact with the officers and men of our Forces.

The Air Force could not possibly maintain such daily contact and association. It was true that they could visit distant localities from time to time but the ordinary method of keeping in touch was to send an aeroplane to circle over those places. This was taken by the inhabitants as a threat. If we were to make these people contented, happy and actively loyal we must inspire them with some higher and deeper feeling than passive acquiescence in our authority.

[Lord Plumer's theory that quartering troops among native populations makes the people contented and actively loyal is interesting.—Ed.]

His second reason was that the principal punitive power of the Air Force lay in bombing. Bombing was a most effective weapon for dealing with raids, aggression across a frontier and so forth, but if applied against the civil population, taking the form of destruction of villages and habitations it was a mischievous power. The memories of bombings would not easily be effaced.

Incurring any expenditure for the maintenance of public security was false economy unless it was quite certain that the measures adopted would be such as to ensure permanent pacification. He had the highest admiration for the gallantry, zeal, energy, resourcefulness and readiness to undertake their duty of the officers and men of the Air Force, but he did not believe from the character and nature of the Force that it was best fitted to be entrusted with the duties of public security.

The Lord Lloyd said that he would like to take the opportunity of associating himself, as one who had lived alongside the Air Force in two different parts of the World for the last twelve years, with the tribute that had been paid to Lord Trenchard and to the work that he had done for the Air Force. None who had seen much of the Air Force, of its spirit and of the gallantry of its officers and men, could fail to feel that its existence in its present condition was a marvellous monument to the zeal, the courage and the enterprise of the noble Lord who opened the debate.

He viewed with alarm the possibility of the Air Force being used as a primary arm on the North-West Frontier of India. The re-conquest of Waziristan in 1920 had cost us 3,000 casualties and several crores of rupees, and this had been followed by the penetration of Waziristan by military roads so that we could reduce our military commitments and yet provide adequate security by swift transport.

Ever since we had adopted that policy of control from within, our policy had been one of civilisation and pacification. We had learned that the crux of the problem was an economic one. There had been no raid into British territory for four years, because the fact of our occupation was relieving the economic pressure. The substitution of air control for ground control was going to involve a complete reversal of our present policy. Whatever air control could do it could never civilise nor pacify people.

[Lord Lloyd did not refer to the possibility of the invasion of India from the North.—Ed.]

With regard to the position in the Sudan and Africa the air arm used alone would afford no security. In East and West Africa and in the Sudan the country was such that it was practically impossible for even a large force of men to be adequately seen from the air. In many African countries the enemy consisted of a single individual but there could be no selection from the air.

The substitution of an impersonal and inhuman agency whose weapons could only be intimidation and punishment for the personal human agency of the administrator in the East and in Africa would have a most damaging effect upon our reputation throughout the East. In the service of policing as in the case of war there was ample room for both the Army and the Air Force.

The Lord Gorell said that Lord Trenchard had been wise in his moderation. He had put forward no claims but had dealt with facts. He had not put forward the Air Force to administrate rather than the civil administration. His point had been that if punitive measures were called for it might be possible for the Air Force to operate more economically and more humanely than bodies of troops on the ground.

The Earl Peel said that the frontier of India was much more than a military or air question. It was very largely an economic question. He hoped and believed that the days of raids and punitive expeditions were over.

The Secretary of State for Air (Lord Thomson) associated himself with the tribute paid to Lord Trenchard and said that it had been Lord Trenchard's lot to have an experience that falls to few men while they are still in the prime of life, in other words to see their life's work reach such complete fruition. Lord Trenchard, when he first joined the Air Force, had found it a nursling among the Services, a nursling that was the subject of apprehension and solicitude, and he had left it twelve years later a sturdy adolescent, eager to assume new responsibilities and, in the light of its already great achievements, justifiably confident of its ability to discharge them. This seemed to the speaker to be no mean achievement in the life of one man, a man in the prime of life.

He did not regard air power as consisting exclusively of Air Forces. It was conceivable that a nation might buy an Air Force and hire pilots and, for the moment, have a very formidable weapon in its hand. But that nation would not possess air power. The principal elements in air power were an Air Force of sufficient size to carry out the policy of the country; air communications sufficiently developed with an air transport system corresponding to the mercantile marine, nourished and fed by an adequate aircraft industry, and last, a highly developed system of aeronautical research. These three elements in air power were absolutely indivisable.

It was no small tribute to the judgment of our Government and of our race that as long ago as the later stages of the War we did establish an Air Ministry and confide to it the development of air power in that extended sense. France, Italy and Greece had followed our example.

[He might have included Finland, which was the first nation to follow our example.—Ed.]

The Air Estimates nearly fulfilled the heart's desire of his advisers. They amounted to a slight increase on air defence in proportion, a slightly greater increase on air communications and a very slight increase on research.

He believed that the policy which should guide a Government in respect of Air Defence was to provide a sufficient Air Force to act as an adequate deterrent to any hostile Government. No means of purely passive defence had yet been devised for dealing with attack by air. Defence was reprisals and the interception to some extent of the attacking aircraft.

He wondered whether, in view of the efficiency and equipment of our Air Force, it really would appeal to any foreign country to drop a bomb upon this island. If our Air Force were twice the size he did not know that it would be more adequate. Nothing got out of date more quickly than aircraft. He believed in security based on political conditions rather than force, but there was a limit below which it would be unwise to fall.

No steps should be avoided and no pains spared to avoid any possible jeopardy to the lives of our airmen owing to shortage or inferiority of equipment.

No Government which was confronted with a proposition which might ensure economy while not sacrificing security could fail to give most careful consideration to such a proposition.

Such a serious matter advanced by a man with the experience of Lord Trenchard of course engaged the serious attention of the Government. But the Government was not committed by that to doing anything at once, either on the North-West Frontier of India or anywhere else.

All that Lord Trenchard had asked for was an inquiry and the Government was, at this moment, giving the matter its most careful consideration. The Prime Minister himself was taking a most active part in the matter as head of the Committee of Imperial Defence and their Lordships would be kept adequately informed of the progress of the investigation.

He assured Lord Cavan that the matter would be referred to the Committee of Imperial Defence. He assured Lord Plumer that it was quite possible that his opinion might be asked by the Committee. The substitution of flying-boats for sloops in the Persian Gulf was in the minds of the Committee and the Committee had to persuade the Government.

He sympathised with Lord Cavan on the subject of endeavouring to humanise warfare, but was surprised that he who had seen so much of war should still believe that anyone could humanise it. Without admitting that a bomb was more cruel than a shell he was sufficient of a cynic to believe that war could never be anything but terrible and if the bomb acted as a deterrent, that was an added reason for the employment of the Air Force.

Only in the last few months a signal success had been achieved by the Royal Air Force in Arabia. A tribe of truculent character led by one of the most truculent chiefs in Arabia had surrendered without a single casualty. Warning bombs had been a deterrent.

No remark had struck himself and his colleagues more, coming from a man of war, than a remark made by a certain distinguished Air Vice-Marshal who had been sent out on special duty the other day to a disturbed area in the Middle East. Before he left he had said, "I shall feel that I have failed if I drop a single bomb on human beings."

It was the most humane of weapons for dealing with these countries because it deterred and prevented and did not always necessarily punish.

He corrected Lord Lloyd's figures. The £1,500,000 that we were now spending in 'Iraq, as compared with the £20,000,000 spent in the past, covered every charge, levies and all, and even a contribution to the 'Iraq Army. Lord Lloyd had committed himself to the statement that it was bad politically to employ the Air Force on the North-West Frontier, but the fact remained that the political authorities in India in 1927 had asked for the intervention of the Air Force.

He presumed that they knew their business. He would be the first to admit that there was no better ambassador of the British race than a battalion of British Infantry but it was a somewhat expensive form of ambassador.

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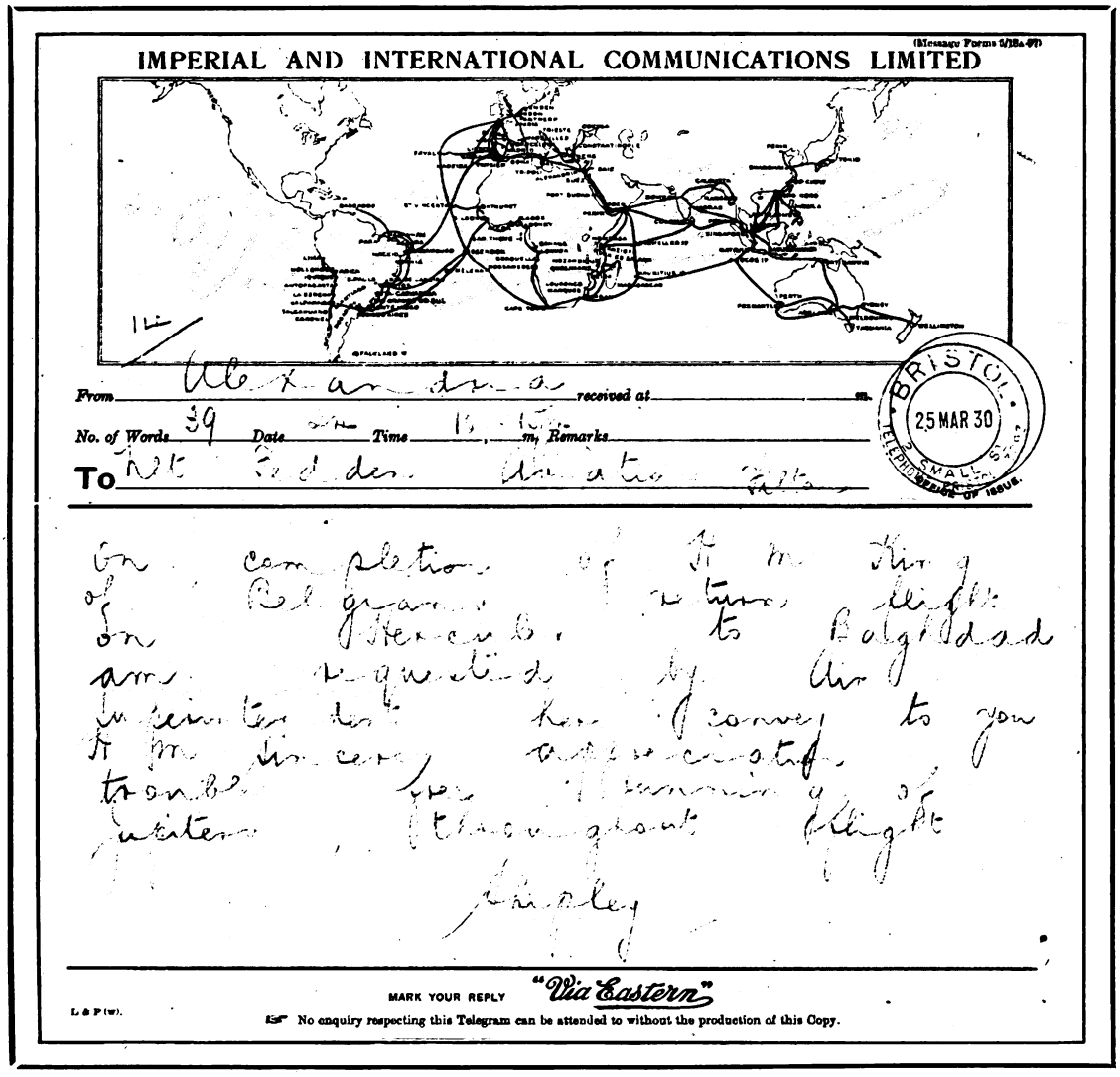

"Trouble-free running"

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His Majesty the King of the Belgians has carried out an interesting air tour to Baghdad from Alexandria in an Imperial Airways D.H. "Hercules" machine fitted with three "Bristol" Jupiters.

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Every town in this country was at the present moment exposed to bombing and one of the greatest and most complicated problems which lay ahead was how we could either restrain the development of Air Forces or so organise ourselves that the abuse of aviation should be no longer possible.

The Earl Stanhope said that he was not at all surprised that the debate had been carried on with such friendly feelings. On almost the last occasion that he went on board one of the aircraft carriers in the Fleet the first thing that happened to him had been that he was heavily attacked by some of the Air Force officers because they felt that it was unfair that they should be living alongside Naval officers who did not receive marriage allowance, while they themselves did. That typified the spirit of the Forces.

He suggested that in the question of reprisals on air attack, was not reprisals by naval bombardment more effective than bombing by aeroplanes from the air? He thought it was impossible to get accurate shooting from the air by bomb, and thought that in order to avoid historical buildings and private dwellings reprisals should be confined to shooting with naval guns. He hoped that Lord Thomson would not speak of the defence of London when he really meant reprisals.

[When he talks of accurate shooting, one wonders whether the Noble Lord has any idea of the average marksmanship of the best naval gunners against a target on land?—Ed.]

Lord Trenchard: I hope this debate has shown the necessity for an inquiry. For instance, I noticed that my noble and gallant friend Lord Beatty, who has now gone, said a flying-boat could not fly in the Persian Gulf for nine months in the year. This is not my information; they fly every day. But still, those are matters for inquiry. I will not follow the last Noble Lord who spoke, Earl Stanhope, into all the details of the relative accuracy of bombing and gunfire. That is a matter for inquiry.

I am perfectly convinced in my own mind that the air arm is just as accurate as any weapon. There is no doubt about it in my opinion. There is still a little idea that we are more brutal and are bound to be indiscriminate and to kill women and children. I have never been able to understand why we may starve women and children by blockade, but we may not use the weapon of the air.

I say again with regard to the air weapon that it can be as accurate as gunfire, and I could have given many instances in which particular military houses of the enemy have been more accurately hit than by rifle fire. I have been out at night with troops with a rifle, and have found it very hard to tell at night the difference between a man or a woman, especially in countries were some women wear trousers and some men skirts, when you are attacking their villages. I say we are just as accurate and careful in the air. But that is all a matter for inquiry, and I hope that the necessity for an inquiry has been shown. I beg leave to withdraw my Motion.

Motion for Papers, by leave, withdrawn.

A LIGHT UPON OUR DARKNESS.

From Apr. 28 to 30 the International Commission on Illumination will hold a meeting in Berlin to discuss the lighting problems of Aviation. At the meeting will be delegates from ten European countries, from Japan and from the United States. At the meeting the delegates will endeavour to find common ground for the discussion of the problems of night-flying and to evolve standard methods of illumination and so on.

The convening of this meeting is apparently due to the enthusiasm and energy shown by Dr. F. Born, chairman of the German Sub-Committee of the I.C.I. and Mr. R. J. Castendijk, the chairman of the Netherlands Sub-Committee. Mr. Castendijk is in charge of the Aviation Department of the famous firm whose title is Philips Gloeilampenfabrieken.

A big British contingent is going to Berlin and one understands that it will include Major R. H. S. Mealing, of the Directorate of Civil Aviation, Mr. H. M. Green from Cranwell, Capt. T. Kerr Jones of the Directorate of Works and Buildings, all of the Air Ministry, Flt. Lt. J. S. Oddie, from the R.A.E., Major R. H. Mayo, of the Aircraft Operating Co. Ltd., and various representatives of firms in the lighting trade,—both gas and electric.

The President of the I.C.I., Mr. C. C. Paterson, Director of the Research Laboratory of the G.E.C., will attend the Meeting.

The internal organisation of the I.C.I. is somewhat complicated and as the Commission was organised to deal with the problems of Photometry, most of its activities are non-aeronautical. The Commission has a number of technical committees which deal with the several particular aspects of lighting. The Secretariat of each technical committee is provided by one country. Thus the technical committee on Aviation Lighting is run by the United States, which seems reasonable when one considers how much more aviation lighting has been done in the United States than in all the rest of the World put together.

For obvious reasons the present meeting could not have been conveniently held in the United States. Therefore the I.C.I. itself is organising the Berlin meeting, the local arrangements for which are being made by the German sub-committee.

THE FLIGHT OF THE DUCHESS OF BEDFORD.

At 05.30 hrs. on April 10 Her Grace the Duchess of Bedford, accompanied by Mr. C. D. Barnard (pilot) and Mr. Robert Little (engineer, navigator and relief pilot), left Lympne to try to fly to the Cape and back in 19 days.

The machine is Her Grace's Fokker F.VII monoplane *The Spider* (Bristol Jupiter geared engine) in which the record flight from England to India and back in seven days was made last August, with the same pilots.

For a month previous to her start on the African flight Her Grace has been learning to fly under the instruction of Mr. Sydney St. Barbe, who is now associated with the firm of Brian Lewis and C. D. Barnard Ltd. In three weeks she had 32 hours' dual instruction, and on April 8 she made her first solo flight at her private aerodrome at Woburn Abbey. The approach for her first landing was over trees and overhead telegraph wires, but in spite of this she made a perfect landing.

Her Grace is 64 years of age, and must therefore be the oldest woman to reach the solo stage. She is to be congratulated on her pluck and energy, not only in learning to fly at her advanced age but also in her persistence in making these long flights in her Fokker monoplane to demonstrate the safety, reliability and speed of aircraft.

Mr. Sydney St. Barbe likewise deserves to be congratulated on his painstaking and thorough instruction.

The preparations for the African flight were made by Brian Lewis and C. D. Barnard Ltd., in their capacity as Aeroplane Specialists, which includes every possible service in connection with aircraft.

To revert to the South African flight—*The Spider* left Lympne at 05.30 hours and flew non-stop over Spain to Oran, N. Africa,—1,100 miles, in a little over 12 hours.

On April 11 the journey was continued to Tunis, *The Spider* arriving there at 12.45 hours.

On Apr. 12 *The Spider* left Tunis and flew to Benghazi. On Apr. 13 she left Benghazi and reached Assiut, Egypt, in the afternoon of that day.

A DOMESTIC FEUD.

The resignation of Lieut. Alford Williams from the United States Navy was reported in The Aeroplane for Mar. 12. Apparently a Naval Sub-Committee of the United States Senate has been investigating the conditions in the Aviation branch of the American Navy. The sub-Committee is reported to be seeking an answer to the question why American bomber and fighter aircraft are, allegedly, from 50 to 90 m.p.h. slower than those of Great Britain, France and Italy. The answer to that question is another question,—Are they? And the answer is,—No they are not.

The Washington correspondent of *The Times* says:—

The American Navy abandoned its attempt to develop racing aeroplanes for international races in 1926. Since that time Lieut. Williams has had to depend on funds advanced by wealthy civilian enthusiasts to finance his experiments, though the loyal support of Admiral Moffett, Chief of Aeronautics—now with the American Delegation in London—has made available to him certain technical assistance from the Navy Department.

Periodically, however, he would be ordered to sea duty by Admiral Leigh, Chief of the Bureau of Navigation, and the fact that Admiral Moffett each time had personally to intervene to prevent this interruption of Lieut. Williams's work is now being advanced in the Press as a proof of a feud between the "battleship school" of admirals and the believers in air development. Six weeks ago, in Admiral Moffett's absence, Lieut. Williams was again ordered to sea, and promptly sent in his resignation. He told part of his story this morning and will be heard again to-morrow.

An important point to remember is that Lieut. Al. Williams is not a regular Naval Officer, and did not pass through Anacostia. Consequently his outlook and methods may differ somewhat from those of other N.O.s. Hence his curious objection to going to sea when required to do so.

The Times continues:—

For last year's Schneider Cup Race Lieut. Williams had produced the Mercury II, driven by two Packard engines capable of developing 1,200 to 1,400 h.p. It would not lift out of the water, because, as he explained, it came from the naval aircraft factory at Philadelphia 880 lb. overweight, and the race was accordingly flown without an American competitor.

Lieut. Williams is to continue his experiments as a civilian, but in the meanwhile the Sub-Committee will seek to discover through him and others why the funds available to the Navy Department for the development of high-speed aeroplanes have not been utilised for this purpose, and whether naval aviation suffers, as the flying-men think it does, from a prejudice in high quarters

His racer never looked like being a success,- when photographs of it are compared with the Supermarines. It had most of the faults of the Italian machines. Moreover, no Packard aero-engine has yet proved itself to be in the first class, judged by either American or British standards. And two unsuccessful engines do not make one first-class one.

Undoubtedly there is some prejudice against aviation among the genuinely antique Admirals in the U.S. Navy, as in our own Navy, but the younger men are wide enough awake. But one fears that Lieut. Al. Williams is not the Heaven-sent apostle of Aviation to put things right.

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Triumph of the GIPSY MOTH *in the Season's first Flying Meeting*

1st. GIPSY MOTH PILOT: MISS W.E. SPOONER

2nd. GIPSY MOTH PILOT: FLYING OFFICER N. BAINBRIDGE

3rd. GIPSY MOTH PILOT: MR. A.C.M. JACKAMAN

THE first Flying Meeting in 1930, held by National Flying Services at Reading on April 5th, resulted in another sweeping success by the Gipsy Moth.

The main event was the Berks, Bucks and Oxon Speed Championship for private owners, over a course of 30 miles. Standard Gipsy Moths finished first, second and third.

This achievement carries on the tradition of 1929 and previous years, in which more competitions of every kind have been won on the Moth than on any other light aeroplane in the world.

SOME 1929 OUTSTANDING SUCCESSES.

Fastest time for light aircraft King's Cup Race.

Fastest time for any aircraft in Australian East-West Race. 2,450 miles.

Winner of heavy category in Challenge International de Tourisme, 4,000 miles round Europe.

Winner of Zenith Cup, 1,150 miles round France.

The Gipsy engine is the only aero engine in the world which carries an indemnity against a forced landing in the event of its failure. Write for details.

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FINAL REPORT of Government Committee

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" There is no danger in streets from the lead . . . . from the exhausts of motor vehicles."

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"We apprehend no danger of the absorption of lead tetra-ethyl through the skin."

IT was on Ethyl petrol that the Schneider Trophy was won for Britain in 1927, and again in 1929. Ethyl Petrol consists solely of first-grade petrol with Ethyl Fluid added, and that is why it does what no other petrol can do :—

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, April 8.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—Flt. Cadet R. T. P. Clarkson, having successfully passed through the R.A.F. College, Cranwell, is granted a perm. comn. as a Plt. Off. on probation with effect from Mar. 11, and with seniority of Dec. 14, 1929; Lt.-Cdr. E. M. C. Abel-Smith, R.N., is reattached to the R.A.F. as a Flt. Lt. with effect from Mar. 30, and with seniority of Jan. 1, 1928; Flg. Off. E. E. Fallick is granted a perm. comn. in this rank (Sept. 1, 1929).

The following Plt. Offs. on probation are confirmed in rank (Dec. 12, 1929):—F. Read, D. F. Satchwell.

The following Plt. Offs. are promoted to the rank of Flg. Off. (Mar. 14):—H. R. Hughes-Hallett, E. W. Downing, L. P. Rowley, R. A. R. Robinson, C. M. D. Chambers.

Group Capt. A. Fletcher, C.M.G., C.B.E., M.C., is placed on the half-pay list, scale B (April 7 to June 30, 1930, inclusive); Flt. Lt. H. T. Herring relinquishes his S.S. comn. on completion of service (April 3).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—W. E. Coope, E. Shipley (Mar. 21); A. W. A. Whitehead, N. B. Massy (Mar. 24); J. L. H. Fletcher, R. C. Tripp, J. W. Radbone (Mar. 25); A. H. Seymour-Lucas (Mar. 26); A. J. S. Negus (Mar. 27); J. A. H. Sargeaunt (Mar. 28). Plt. Off. G. B. K. James is promoted to the rank of Flg. Off. (April 2). The following Plt. Offs. on probation are confirmed in rank:—J. G. G. Moore (Mar. 18); K. R. Warton, H. C. S. Brand (Mar. 21); T. F. Owen (Mar. 25); J. W. Bradley, P. Johnson (Mar. 26).

Flg. Off. G. Terrell is transferred from Class A to Class C (Dec. 8, 1929); Flg. Off. R. D. Adams relinquishes his comn. on appointment to a comn. in the Indian Army (Mar. 7).

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—The following Plt. Off. to be Flg. Off. (Feb. 28):—E. S. V. Burton.

H.R.H. The Prince of Wales.

His Royal Highness the Prince of Wales, K.G., who is a Group Captain in the R.A.F., flew from Malakal to Khartum on April 13 in a Fairey III.F of No. 47 (Bomber) Squadron, R.A.F., piloted by Flt. Lt. W. A. B. Bowen-Buscarlet. The journey was made in the face of a strong wind and the machine landed at Kosti to re-fuel.

On arrival at Khartum His Royal Highness was received by an escort of No. 47 (Bomber) Squadron flying in formation over the aerodrome. The journey from Malakal took five hours.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Duxford, Cambs., to a Siskin machine of No. 19 (Fighter) Squadron, Duxford, on April 8, Flg. Off. Roger Pridgin Teale, the pilot and sole occupant of the aircraft, was killed.

An inquest was held at Duxford Aerodrome on April 9 on the body of Flg. Off. R. P. Teale. Sq. Ldr. Reginald Keary said that on Tuesday three aeroplanes, including Teale's, were on the aerodrome ready to make a flight. In attempting to take off the centre machine with the flight leader on board failed to rise. The other two did. Teale on the left turned round when about 200 ft. up and then got into a gliding turn which caused the machine to stall and crash. His theory was that Teale, seeing that his flight leader did not get off the ground, turned to watch him, and seeing that he did not rise, attempted to land. He was evidently paying too much attention to his leader's movements and did not pay sufficient attention to his landing. Teale was a very capable pilot and one of their best men. A verdict of "Accidental death" was returned.

The Air Ministry regrets to anounce that as the result of an accident at Eastchurch to a Grebe machine of the Armament and Gunnery School, Eastchurch, on April 10, Flg. Off. Ernest Leonard Wilson, R.A.F., the pilot of the aircraft, and No. P/J.111484, Telegraphist James Ronald Armison, Royal Navy, were killed.

An inquest was held at Eastchurch on April 11. Mr. Wilson, the father of Flg. Off. Wilson, was given permission to ask questions. He asked Flt. Lt. Lester whether it was part of a pilot's training to put the machine into a spin. Flt. Lt. Lester: "It is a part of their training. In this particular case the machine climbed to about three thousand feet, and then went into a spin quite gently. Pilots were not supposed to go into a spin below two thousand feet."

"Was the machine airworthy all over?"—"Yes, the internal bracing was examined on April 9, and when tested was found quite satisfactory."

"It was a practice flight. Does that mean it was for instructional purposes?"—"Yes."

"The passenger was a novice, would it be possible if he became nervy to affect the pilot's control of the machine?"—"It is a possibility. There are two sets of controls, and one is at the back seat."

"When in a spin or if a machine is falling are there no other means of assistance, such as a parachute?"—"The pilot and passenger were both wearing parachutes, but they had not been used."

"Is it true that they were fastened in the machine?"—"You must be fastened in to do aerobatics. If you are not fastened in your would come out of the machine."

The jury returned a verdict of "Accidental death."

An inquest was held at the Cambridge Hospital, Aldershot, on April 8, on the body of Serjeant John Martin, R.A.F., who died in the hospital from injuries received in an accident to an aeroplane which overturned in landing at the Farnborough Aerodrome.

Flt. Lt. Atcherley stated that on Mar. 17 he flew a Grebe aeroplane from Kenley to Farnborough, and in landing he smashed the undercarriage. The result was that the machine overturned and Martin was thrown out very heavily. Sjt. Martin had been flying the machine and had made two unsuccessful attempts to land. The officer then took it over, as he could see the ground was bad and he thought he could make a better landing. The ground was bumpy where he landed. The machine was in good order before the flight.

Sjt. White, who was flying another machine in formation with Flt. Lt. Atcherley, stated that while they were in the air he saw Martin's straps come undone. Martin tried to fasten them, but was unsuccessful.

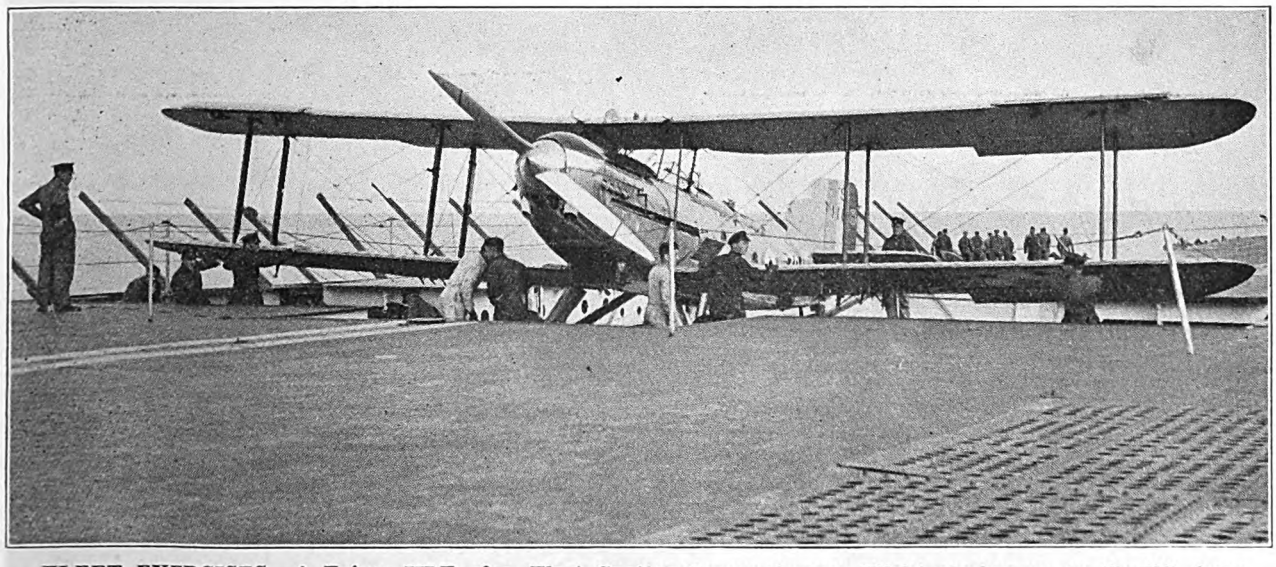
Edgar Schofield, an Air Ministry official, stated that considerable repairs were being carried out to the rough ground of the aerodrome. He did not think, however, that the ground was more than partly responsible for the accident, as he had seen numerous other machines land safely at the same spot.

The Coroner recorded a verdict of "Accidental death."

The Piloting of Service Aircraft.

A recent amendment to The King's Regulations and Air Council Instructions for the Royal Air Force reads as follows:—

797*A. Flights by Foreign Personnel in R.A.F. Aircraft and by R.A.F. Personnel in Foreign Aircraft.*—1. Invitations to personnel of foreign naval, military or air services to pilot British service aircraft will not be given. Invitations to fly as passenger will be given only after



FLEET EXERCISES.—A Fairey III.F of a Fleet Spotter Reconnaissance Flight coming up on the lift from the hangar to the flying deck of H.M.S. "Furious" during the recent Fleet Exercises in the Atlantic

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obtaining the prior consent of the Air Ministry or, in the case of aircraft embarked in one of His Majesty's ships which is visiting a foreign port, of the senior naval officer present. Such consent will only be given in exceptional circumstances in which the giving of the invitation would be in the public interest. All such flights will be undertaken at the risk of the person making the flight, who must complete a Form of Indemnity before any such flight is carried out.

2. The acceptance by R.A.F. personnel of invitations to pilot the service aircraft of any foreign power is forbidden. Invitations to fly as passenger in such aircraft will not be accepted without obtaining the prior consent of the Air Ministry or, in the case of personnel embarked in one of His Majesty's ships which is visiting a foreign port, of the senior naval officer present. Such consent will only be given in exceptional circumstances in which the acceptance of the invitation would be in the public interest. Personnel carried in foreign service aircraft with due authority under this clause will in the event of injury or death be dealt with for non-effective purposes as if the aircraft had been a British service aircraft.

The Express Defence of Great Britain.

According to that enterprising journal, *The Daily Express*, of April 14, London has been the focus of a series of air raids for the past two weeks, but, owing to a "miraculous instrument" used by the defenders, London "is as safe to-day as it is possible to make it from attacks by invading airplanes."

The form of defence is described as "a seemingly miraculous instrument which conveyed nearly all the essential information to the defenders."

Apparently the special correspondent of *The Daily Express* has based his story on a recently published Air Ministry Notice which warned civil aircraft that R.A.F. machines would be flying over a certain area near London at night without navigation lights. This notice refers to the normal night flying training of the R.A.F. and appears every year.

The "miraculous instrument" is, presumably, the simple listening apparatus which is used by the Anti-Aircraft Territorial Defence formations to direct the operations of the searchlights, and is also used by the Observer Corps, an organisation of volunteers which mans listening posts and observer centres under the County Police over the greater part of England.

This apparatus was described and illustrated in The Aeroplane of Aug. 22, 1928, in the account of the Exercises of the Air Defence of Great Britain of that year. The listening apparatus is simple but effective and is used in connection with the general system of defence.

The Daily Express correspondent exposes his ignorance by describing the attack on the defences being made by fifty single-seater fighters. The fighter squadrons of the R.A.F. are used for defence and not for attack.

Although the article in question is not likely to be treated seriously by intelligent persons, the assertion that London is no longer vulnerable to attack is distinctly mischievous. The Air Exercises of 1927 and 1928 proved conclusively that although the Air Defence of this country is built on a sound and elastic foundation it is, by reason of its smallness, in no way adequate to deal with any sustained form of attack from the air. Public co-operation is now, and will always be, needed to man the Territorial Defence formations, to man the Observer Corps, and also to supply the Treasury with the necessary funds for the efficient maintenance of the R.A.F.—C. M. MCA.

More Caterpillars.

On April 11 a Hawker Hornet, which was being tried out under Service conditions at Tangmere, and was piloted by Flg. Off. K. S. Brake, of No. 1 (Fighter) Squadron, R.A.F., collided with an Armstrong Whitworth Siskin, piloted by Flg. Off. J. H. Percy, of No. 43 (Fighter) Squadron, R.A.F., at about 3,000 feet, near Chichester, on April 11. The top wing of the Hornet and the undercarriage of the Siskin were removed by the impact. Both pilots took to their parachutes and alighted safely.

Mr. Brake's arm was broken by a piece of his machine hitting him as he was getting out, but fortunately he was able to release his parachute.

The Old Comrades Association.

The inaugural meeting of the Old Comrades Association, R.F.C., R.N.A.S., and R.A.F., will be held at 18.00 hours on Wednesday, Apr. 23, at Ye Old Dr. Butler's Head Restaurant, Mason's Avenue, Coleman Street, E.C.2.

The purpose of the meeting is to form the Association and to elect provisional officials.

Anyone interested in the formation of this Association should write to Mr. W. Coen, R.A.F. Station, Eastchurch.

Association Football.

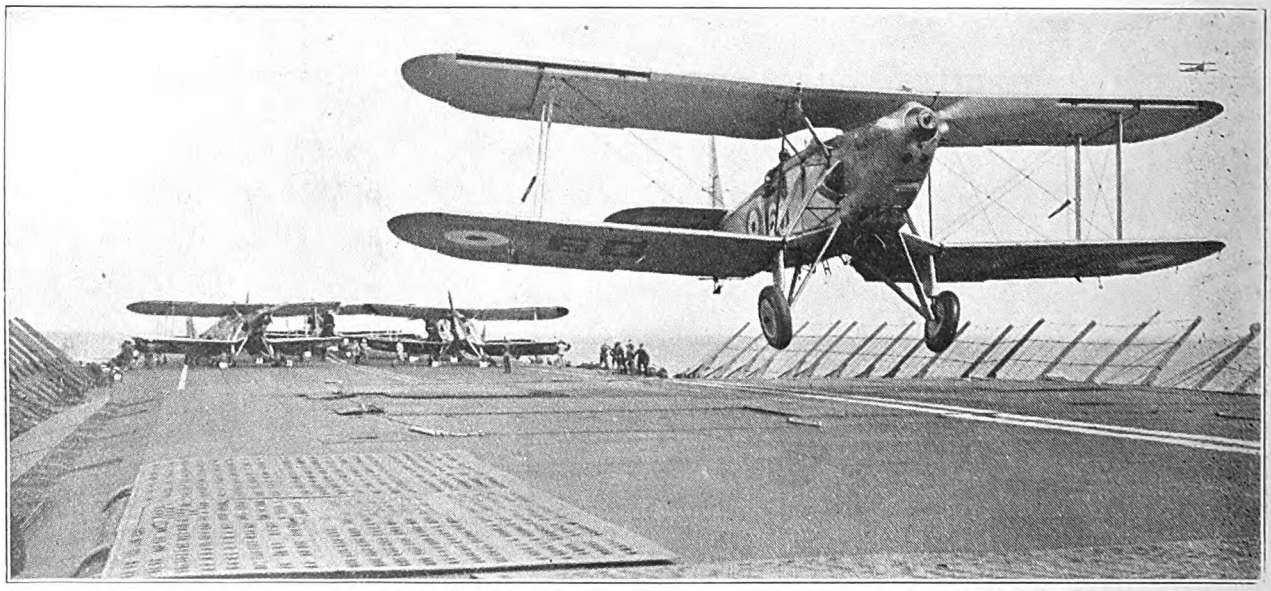
The final for the R.A.F. Association Football Cup was played at Uxbridge on April 9 and resulted in a draw of 2 all after an extra 30 minutes had been played.

Vigorous football on both sides, an exceptionally fine display by AC. Kelly of Henlow, and a sterling performance by the Kenley custodian, were features of the game. In general the Kenley team were much quicker on the ball, but their movements were not so well organised.

S-M. May of Northolt had charge of the game.

Henlow were early on the move and receiving from Martin, Kelly forced Potter to tip over the bar. Returning to the attack, Kelly tricked his way cleverly into the danger zone before passing to Rule, who, however, shot wide. A good clearance by Johnson sent Kenley away, and Hill foolishly attempted to dribble the ball just outside the Henlow penalty area, with the result that Rowley secured possession and forced Malin to his knees to clear a splendid shot. The ball was immediately put across to Prince, who appeared to be in an offside position, and the latter drove into the net. Rule presented Kelly with a glorious opportunity but Johnson hurled himself bodily at Kelly's shot and saved an almost certain goal. A splendid long shot by Norcott was tipped over the bar by Potter. At this period Henlow had much the better of the game, and Potter was continually called upon to save shots from Hill, West and Kelly. After 40 minutes Kenley again got away, a splendid movement by Prince and Parrish culminating in a shot from the latter which gave Malin no chance.

On the resumption of play Rule was limping badly, and went to the outside right position, Kelly and Martin moving in. From a free-kick just outside the penalty area Robinson sent in a lightning drive, which Potter saved brilliantly at the expense of a corner, and a few moments later Johnson nearly diverted a shot from Hill into his own goal. After 15 minutes of the second half, West got away on the wing and centred smartly to Kelly, who netted with a deliberate shot. In attempting to clear a shot from Hill, Potter left his charge, and Kelly sent in a lob shot which went well over the custodian's head. Flynn made a great effort to kick out from the proximity of the line, but the referee adjudged that the ball had entered the net. Exciting end to end play continued, in which Henlow had rather more of the play, and only good defence by Johnson and Flynn, combined with the astuteness of Potter, saved Kenley.



WELL AWAY.—A Blackburn Dipon of a Fleet Torpedo Bomber Flight flying off the deck of H.M.S. "Furious" during the recent Fleet Exercises in the Atlantic. In the background are the other machines of the Flight waiting to take off.

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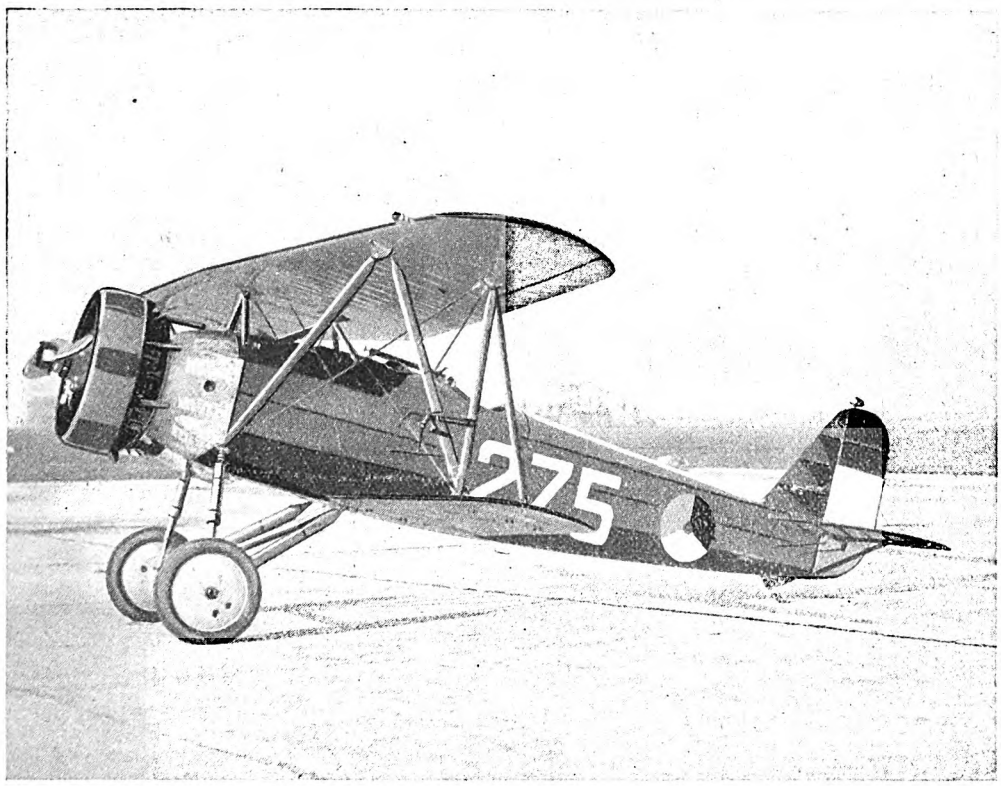

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THE KENLEY TEAM.—Left to right: L-AC. Gibson, AC.1. Prince, AC.1. Flynn, L-AC. Potter, Cpl. Timson. (Front row): Cpl. Lee, AC.1. Parrish, Cpl. Johnson, Flt. Lt. Croome, Flg. Off. Rowley, AC.1. Godson.

Extra Time.—From a throw-in on the right, the ball was punted to Croome, who shot over when well placed. Rule and Kelly again got away, but found Potter safe. Shortly before the change of ends, West sent Kelly away, and Potter saved smartly. During the concluding stages of the game Parrish gained possession from a throw-in, and shot just over the bar.—C. H. H.

COMBED FROM THE BEACH.

According to the aeronautical correspondent of *The Daily Mail*:—

Remarkable stories are reaching London concerning a hybrid, man-carrying apparatus which is said to be part aeroplane and part submarine. Several foreign Governments, it is reported, have been made aware of its existence.

The machine is said to be undergoing secret tests at a lonely point on the Danish coast. It has a metal boat-like body with telescopic metal wings. The latter, apparently, can be drawn in or reefed alongside the body; whereupon the crew, closing watertight compartments, can submerge their vessel and operate it beneath water.

Beneath the body is an amphibian type of gear, with wheels, enabling the craft, when desired, to leave air or water for land and move about on the ground.

The Secret Service Department of The Aeroplane can supply details of a still more amazing craft.

It is actually a metalised version of an Early Victorian bathing machine designed by a retired hirer of deck chairs domiciled in Walberswick. In his development work he had the assistance of Dr. Strabismus (whom God preserve), of Utrecht, but owing to the erosion of the Suffolk Coast and the air of uncertainty caused by Mr. Snowden's budgetarian reticence, the ingenious designer has been forced to transfer the scene of its activities to the Danish coast where groynes and groans are less prevalent.

Apart from its military value, and all aeronautical experts are fully in agreement as to its perfectly preposterous possibilities, it can be used as an aquarium (by unwatertightening its watertightness while submerged), as an artist's studio, as a sanatorium for debilitated aspidistras, as a perambulating lock-up for disowned and wandering Alsatians, or as a totalisator.

Its equipment is as complete as is possible to conceive. When the interior is full of bombs, torpedoes, fish, artists' models, aspidistras, Alsatians, or money, the wings, instead of being drawn in are "reefed" alongside the body (of the craft) by a catch or pawl, as already described.

A special scale for weighing the anchor is included, which by a slight adjustment of the complicated mechanism, may be arranged to box the compass, or get Schenectady on the radio.—L. B.

THE HENLOW TEAM.—Left to right: Cpl Robinson, L-AC. Hill, L-AC. Norcote, Cpl. Pond, L-AC Lowe. (Front row): AC. Mawdsley, AC. Martin. AC. Kelly, Sjt. Malin, Flg. Off. Rule, L-AC. West.

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IMPORTANT DATES.

April 17.—Spring Session at Cranwell ends.
April 17.—Start of Easter Tour of Europe, Heston Air-Park.
April 19.—Leicester Flying Meeting (Leicestershire Aero Club) (with R.A.F. support).
April 20.—Zeebrugge (1918) Association Church Service.
April 21, Easter Monday.—Meeting at Hanworth.
April 22.—Re-Union Dinner of Zeebrugge (1918) Association.
April 26.—N.F.S. Meeting at Leeds.
April 26.—No. 45 Squadron Re-Union Dinner.
May 5.—R.A.F. Staff College, Second Term begins.
May 10.—Athletics. Triangular Tournament: R.A.F.C., R.M.C., and R.M.A. at Woolwich.
May 17.—Brooklands Flying Display and opening of Brooklands Aero Club.
May 29.—Royal Tournament at Olympia opens.
May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support).
June 7.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—R.A.F. Garden Party at Manston.
June 15.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gwynn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
July 3.—Indian Empire Garden Party at Hurlingham.
July 5.—King's Cup Air Race (Royal Aero Club—Heston Air Park).
July 13.—N.F.S. Meeting at Leeds.
July 19.—N.F.S. Meeting at Hull.
July 20—Aug. 7.—International Touring Competition.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

M. ADHEMAR DE LA HAULT.

On March 6, 1930, M. Adhemar de la Hault, director and founder of our Belgian contemporary, *La Conquête de l'Air*, died in Brussels from an illness from which he has been suffering for several months.

M. de la Hault was one of the founders of the *Aéro Club Royale de Belgique* in February 1901, and in May 1904 he founded *La Conquête de l'Air*, which journal he directed until 1923. He was also founder of the *Aéro Club d'Anvers*, and was one of the founders of the *Société Nationale pour l'Etude des Transports Aériens*, commonly known as the Sneta, the forerunner of the Sabena and Sabca companies, which now represent Civil Aviation in Belgium.

It will thus be seen that M. de la Hault has played a very important part in the development not only of Belgian aviation but of aviation in Europe.

His death is a very severe loss to Belgian aviation, and on behalf of all British aviation THE AEROPLANE offers sincere condolences to Belgium on the death of a very remarkable and courageous gentleman.—L. B.

A REGISTER OF CIVILIAN AIRCRAFT.

"A Register of Civilian Aircraft," by R. L. Preston, was originally reviewed in THE AEROPLANE of Nov. 20, 1929.

Aircraft frequently change hands and to keep the register up to date Mr. Preston issues Amendments to the Register every three months.

The second of these Amendments is now ready and may be obtained from THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, London, E.C.4, price 6d. post free.

THE BLIND LEADING THE BLIND.

[*A Narrative History of Aviation.* John Goldstrom. xii + 319 pp. Many illustrations. Index. The Macmillan Company, New York. 17s.]

Mr. Goldstrom is a little unfortunate in that he antagonises the informed reader right from the very first paragraph of this book, for he states that:—

> The name of the first experimental aviator has not been handed down to modernity. Probably he was a man of prehistoric time. Conceiving the daring notion that the pterodactyl might be domesticated and ridden through the air, he decided, against the advice of family and friends, to attempt it.
>
> Finding one of the great flying reptiles dozing on a rock in the sun, he managed to steal upon it and to fasten himself above and between its bat-like membranous wings. The next instant there was a fearful hissing squawk, and a flapping and beating of huge pinions.
>
> Terrified but determined, the man found himself in the air. But for hardly more than a moment. With an angry toss of its writhing body the pterodactyl freed itself of the impudent groundling and dashed him to the rocks below.

The ribald can probably criticise such utter nonsense in a better, and certainly more concise, form than can a reviewer in a respectable journal like this.

The author then proceeds to give briefly some account of the early history of aeronautics. He does not give anything new, and this part of the book is marred by carelessness in the giving of names,—for example, "Stephen and Joseph Montgolfier," instead of Joseph Michel and Etienne Jacques de Montgolfier, and "George Peacock," for George Pocock, and so forth. Also, he has somewhat quaint ways of describing eminent men, for example, all the reader is told of the qualifications of John Wilkins, sometime Bishop of Chester, founder of the Royal Society, and a most distinguished philosopher, is that he "died in 1672" The rest of this chapter contains many dangerous half-truths.

We then proceed to some chapters dealing with the work of the Wright brothers, and their dispute with the Smithsonian Institute. This is certainly the best part of the book, as it contains much interesting information. The book then deals with some of the famous early flights, and is rather sketchy.

The chapter dealing with "Aviation and the World War" is farcical, and is worse than useless. The next part of the book deals with the progress of Civil Aviation in various parts of the World since the Armistice. This is certainly informative, though marred by mistakes and badly written.

Although the book was only published this year, the world's speed record for seaplanes is given to Major Bernardi—an example of the carelessness that characterises the book.

The present reviewer was, at first, delighted to see that the author had included a bibliography, but his joy was damped when he examined the books that were included in this list. No mention at all is made of the Official History—*The War in the Air*—although possibly a book like *The Balloon Buster* is more to the taste of Mr. Goldstrom's readers. Under "Historical and General" no mention at all is made of Hodgson's *History of Aeronautics in Great Britain*. In the list of periodicals some of the addresses and names of the journals are inaccurate.—C. L. S. G.

AND NOW WHAT?

The twenty-ninth report of the Straits Commission, which has just been circulated to members of the League of Nations, refers to the passage through the Dardanelles last June of a squadron of 34 Italian seaplanes on their way to Constanza.

The report expresses the opinion that the presence in the Black Sea of so many aircraft disturbed the equilibrium contemplated by the Straits Convention, as the Soviet Government at that time possessed only 22 training seaplanes.

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The Times, Jan. 21, 1930.

"Mr. Grey and his able assistants, Mr. Leonard Bridgman and Mr. Howard Flanders are to be congratulated upon having produced the most fascinating as well as the most comprehensive of all aeronautical reference works . . . . 'All the World's Aircraft' has maintained its high reputation for accuracy while it has greatly enlarged its scope."

The Journal of the Royal United Services Institution.

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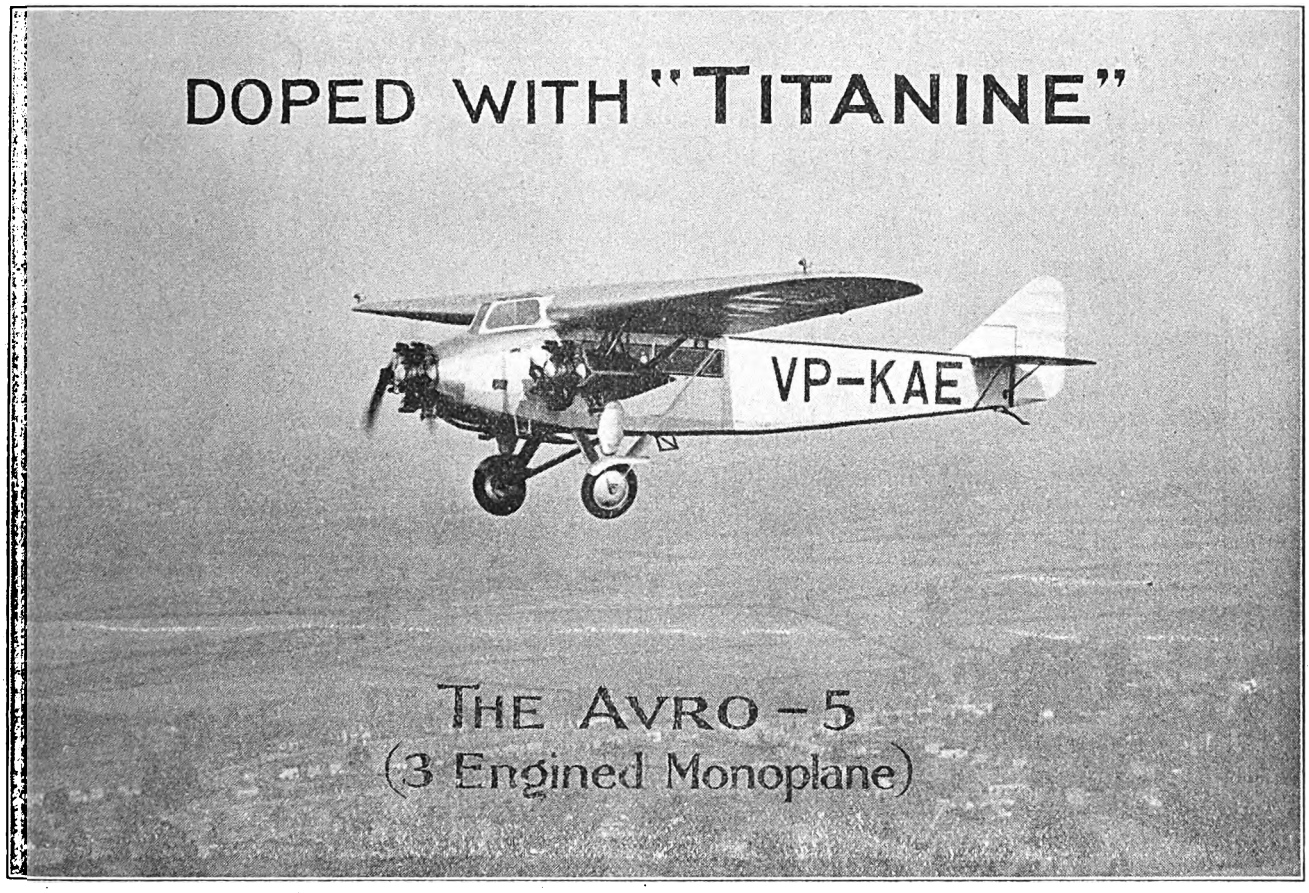

("Aeroplane" photograph.)

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

HESTON FEELS THE SPRING.

There were numerous signs at Heston last Friday that the species of the genus pilot which hibernates during the winter are about to put in their 1930 reappearance. The springlike weather, although somewhat thick as regards visibility, brought them out in droves, and Moths, Bluebirds, Klemms and Avians fussed about the neighbourhood with a nesting-season air.

Sir Sefton Brancker, Director of Civil Aviation, was proceeding to Hull for the N.F.S. Meeting next day, and took off in a Bluebird of Auto Auctions Ltd., with H. S. Barrow beside him. Another Bluebird went with them, piloted by Mr. H. J. Andrews. The special suitcase that has been designed for the luggage locker of these machines had been packed with enough dunnage to fill a small trunk and slid into its hole with impressive handiness. Sq. Ldr. Ridley and Col. Saunders, of Auto Auctions Ltd., were on hand to see the party away.

Mr. Muntz, of Airwork Ltd., was busy with matters to do with the Spring attack,—a feature of which will be the Heston Sunday Afternoons. He detached himself long enough, however, to try the Junkers Junior, G-AATH (Genet engine), which came over from Croydon with Mr. H. R. Trost and Mr. Clarke. This very attractive younger brother of the large Junkers seems likely to do them credit. The cleanness of its lines is its most striking feature, and it does a top speed of about 102 m.p.h. Mr. Baker, Chief Instructor of Airwork Ltd., took it for a test flight, as did several other interested pilots, and gave its performance high praise. The Junkers appeals to the eye as an aeroplane *par excellence* for minimum maintenance and an out-of-door existence. It seems to have a high stalling speed, as it requires a good run to get off and lands somewhat fast, but it is not easy to hurt its feelings in the air if the antics of the guest pilots prove anything.

On Sunday a demonstration was given by Mr. Duncan Sinclair of the Graham Amplion wireless receiving set for light aeroplanes.

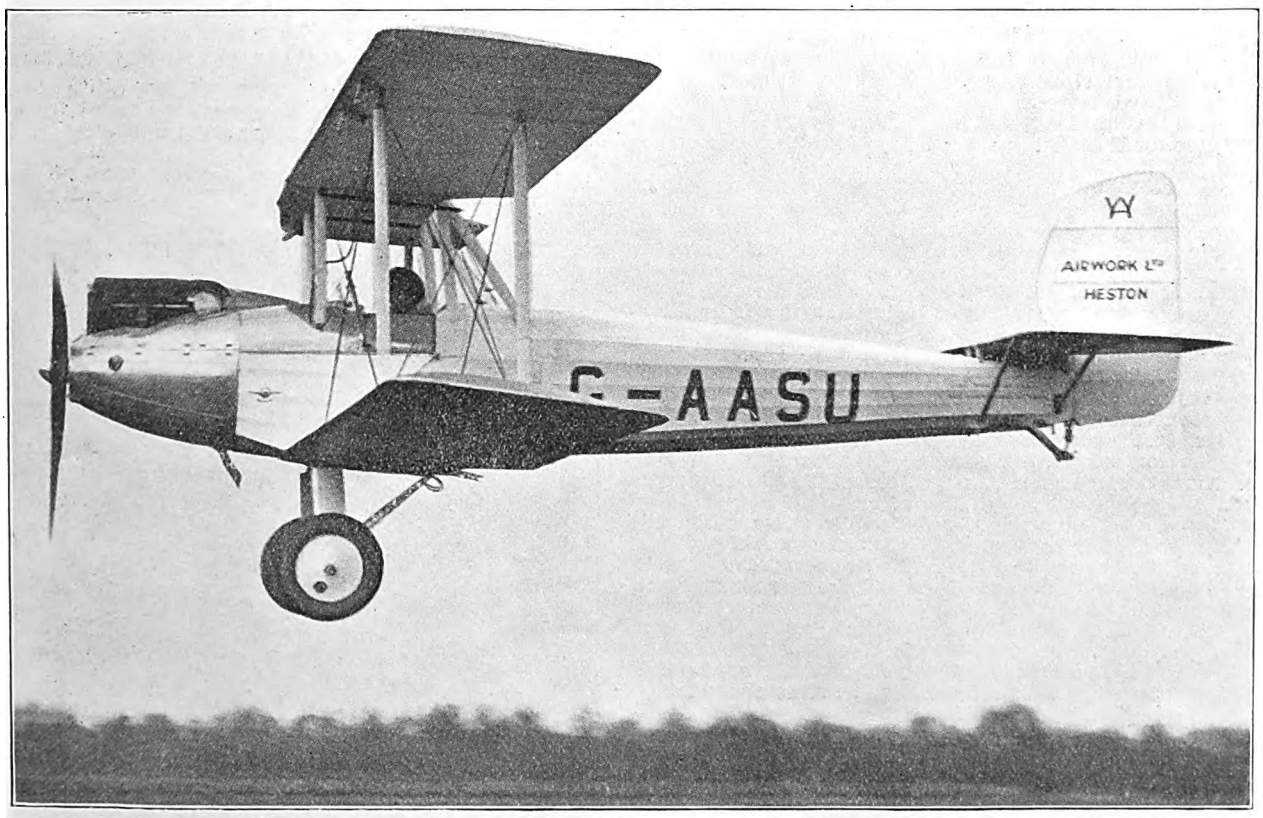
Mr. R. H. Windsor, of Airwork Ltd., flew practically all the afternoon in a school Moth with interested passengers, who also watched proceedings from the wireless room in the control tower before or after their flights. It was perfectly obvious to all spectators that the pilot was getting the signals without difficulty, as he promptly obeyed all the instructions given by Mr. Sinclair or his various understudies. In view of the regularity with which wireless apparatus develops atmospherics, or otherwise refuses to show off at crucial moments, the demonstration was a phenomenal success.

For one thing, the ordinary De Havilland earphones and voice-tube are used, and one noticed, as soon as they were adjusted in the passenger's cockpit that conversation with the pilot was unusually easy. In the course of some little time spent in tandem two-seaters one has discovered a hundred and one things that may reduce communication to unintelligible shouting, when the wireless could hardly be expected to give satisfaction. The reception is introduced into the standard voice-tube without interfering with its ordinary uses in any way, except, of course, that conversation should be suspended during wireless reception to get the best results. Both pilot and passenger can hear each other, and the signals from the ground, and on Sunday, when Mr. Windsor admitted that reception was unusually good, they could be heard just as clearly as the voice of the pilot a yard away.

The pilot remarked rather plaintively, while executing an order for a figure of eight over the north-east corner of the aerodrome, that the announcer was not very well up in his air regulations, but either he had to transgress the rules to order or spoil the effect of the show. The only time that delay was noticed in obeying an order was when Mr. Windsor chose to postpone delivery of a loop—with lady passenger—while he climbed to a higher level than 500 feet.

Pilots who affect the attitude, so well known in all professions, of making out that innovations of this sort tend

"IN FACT, 'TIS THE SEASON OF BILLING AND COOING, AMOROUS FLYING AND FOND PURSUING."—(R. BUCHANAN.)



IN THE MERRIE SPRING.—A Blackburn Bluebird, belonging to Airwork Ltd., taking the seasonable air. Its seating plan presents definite advantages over the "bicycle built for two."

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THE HULL AERO CLUB MEETING.—Sir Sefton Brancker declaring the Club-house open.—The Lord Mayor of Hull (Councillor R. Richardson) and the Managing Director of N.F.S. Ltd. (Lt.-Col. Ivo Edwards).

to enervate the rising generation and detract from self-reliance, may say that a wireless receiver is a needless luxury for early solos, but whereas it would be quite possible to tie a beginner too closely to his instructor's apron-strings—or antennæ—there can be no doubt about a great increase in safety during the first hour or two of solo.

During and after the demonstration the activity on Heston Air-Park was quite inspiriting. Besides Klemms, Moths, Avians and Bluebirds, there were several Desoutters arriving, departing or "aerobatting." A Moth III flew over and disappeared again at impressive speed, an Avro V landed from foreign parts, and Mr. Clarke demonstrated the Junkers Junior in some inverted flying and slow rolls that were quite remarkable for a low-powered machine with high wing loading.—F. D. B.

Incidentally the Heston Easter Tour, in which twelve or fifteen machines will journey round the Continent, will start from the Heston Air-Park somewhere between 11.00 hrs. and 12.00 hrs. on Thursday (to-morrow), April 17, so people who want to see the start of this impressive procession should be there in good time.

THE HULL MEETING.

The new club-house of the Hull Aero Club at Hedon was opened by Air Vice-Marshal Sir Sefton Brancker, the Director of Civil Aviation, on April 12. The weather was kind and the conditions ideal. Hedon is the Municipal Aerodrome for Hull and was opened by H.R.H. Prince George on Oct. 10, 1929.

There was a big attendance, and something approaching ten thousand people watched the Air Pageant.

There were ten competitors in the Kingston-upon-Hull race, the course for which was four laps of seven and a half miles. The race was open to all private owners and members of flying clubs. The first prize was the Challenge Trophy, presented by Sir Arthur Atkinson, which is held for one year, and a replica, to be won outright.

The first machine home was Miss Pelly's D.H. Moth, piloted by Flg. Off. H. H. Leech. The second was the A.D.C. Cirrus-Hermes Avian, piloted by Flg. Off. Thorn, and third Miss Spooner, who was naturally flying her own machine.

As Mr. Leech was disqualified for failing to round a turning point correctly, Mr. Thorn won the Trophy, and Mr. Ivor Thompson, who flew his D.H. coupé Moth, was placed third.

After the opening lunch, Sir Sefton Brancker said that the Sheriff of Hull had promised that Hull would produce a cup for the King's Cup Race. Hedon aerodrome was a stopping place in that race. Hull had the third municipal aerodrome to be licensed. To-day there were five municipal aerodromes, eleven more would be licensed in the near future, and twenty-one were "in the offing."

We were still, compared with the United States, behind the times, though the U.S.A. had not to bother about international complications.

ZANZIBAR—NAIROBI.

The arrival by air of Mr. Campbell Black in Zanzibar was reported in The Aeroplane for April 9. On April 8 Mr. Black made a return flight non-stop to Nairobi in 5 hrs. 20 min. The machine was the D.H. Moth which belongs to Wilson Airways Ltd.

AT HULL.—Mr. Jackaman, Miss Spooner, Miss Winifred Brown, and Sir Sefton Brancker.

THE CHALLENGE INTERNATIONAL DE TOURISME.

The French Air Minister has put aside the sum of 200,000 francs for the French participation in the forthcoming *Challenge International de Tourisme.*

This sum of money will be apportioned as follows:—

20,000 francs will be put towards the cost of the organisation of the contest in so far as it concerns France,—that is the preparation and organisation of the French controls, etc. The remainder of the money will be divided among the French competitors.

The first, second, third and fourth French competitors, flying French aircraft with French engines, to finish will receive 30,000, 20,000, 10,000 and 5,000 francs respectively. If the first French competitor to finish is classified first in the competition he will receive an additional 30,000 francs.

The remaining 85,000 francs will be allotted as prizes to French competitors in proportion to the awards of points for technical and constructional qualities, as determined by the German Aero Club in the Technical Tests which will be held in Berlin after the Tour of Europe.

THE NEXT BROOKLANDS FLYING MEETING.

The Brooklands School of Flying Ltd. is organising a Flying meeting for May 17, to inaugurate the new Brooklands Aero Club, which has been formed by this enterprising school.

An "All-star" programme has been arranged. This will include flying exhibitions by Mr. Hubert Broad and Mr.

THE HULL AERO CLUB MEETING.—Left to right: Mr. I. W. H. Thompson, who was third; Mr. Mallinson; Flg. Off. Leech, who was first in the race but was disqualified; Capt. Thorn, first; and Mr. E. S. Olney of Cirrus Aero-Engines Ltd.

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ON DOUGH-NUTS.—A Great Lakes 2T.1 two-seat light biplane (American Cirrus III engine) with Goodyear Air-Wheels. This machine is claimed to be the first light aeroplane to be fitted with these wheels.

Murray, the Brooklands Schools' own *as de virtuosité,* a parachute drop by Mr. Tranum, and a number of competitions will also be held. An Autogiro and several other interesting aircraft will also be present.

The training staff of the Brooklands School has been added to by the acquisition of Mr. George Lowdell, late of the Suffolk and Eastern Counties Aeroplane Club.

Mr. Lowdell joined the Suffolk Club from the R.A.F. towards the end of 1927 and since then he has demonstrated his ability as an instructor and also as an exhibition and demonstration pilot of the highest order.

The instructional staff of the School is now complete for the coming season and by virtue of its highly skilled personnel and the standard of training set and obtained by them the school deserves to be classed as the *haut école* of aviation training in this country.

THE BRISTOL INTERNATIONAL AIR PAGEANT.

At the International Air Pageant at the official opening of the Bristol Airport by His Royal Highness Prince George on May 31 two races are to be held:—

(A) The Race for the Society of British Aircraft Constructors' Challenge Cup and the Bristol Aerial Derby.

The Society of British Aircraft Constructors' Challenge Cup carries with it a cash prize of £75 and is awarded to the light aeroplane club which enters the winning aircraft. The race is over a course of approximately 30 miles.

(B) The Bristol Aerial Derby is an open handicap race for the following prizes:—1st, Cup, presented by Merlyn's Motors Ltd. and £100; 2nd, £50; 3rd, £25.

Both races will be under the Competition Rules of the Royal Aero Club and the *Fédération Aéronautique Internationale.*

Entry forms and further details can be obtained from the Bristol and Wessex Aeroplane Club, Bristol Airport.

THE ACCIDENT AT FELTHAM.

The inquest upon the body of George Edward Watts who died from injuries received when his machine crashed at Feltham on April 5, was held at Hounslow on April 8.

The Times says:—

Captain Maxwell Findlay, of the National Flying Services, said that Watts was an average pilot, having flown 17½ hours' dual flight and four hours' solo. His opinion of the cause of the crash was that most probably Watts stalled his engine and lost his speed, catching the trees before he regained it.

The jury returned a verdict of "Accidental death," adding a rider to the effect that they considered pupils should have longer tuition before being allowed to fly solo. They did not think that the time spent in the air by Watts was long enough tuition.

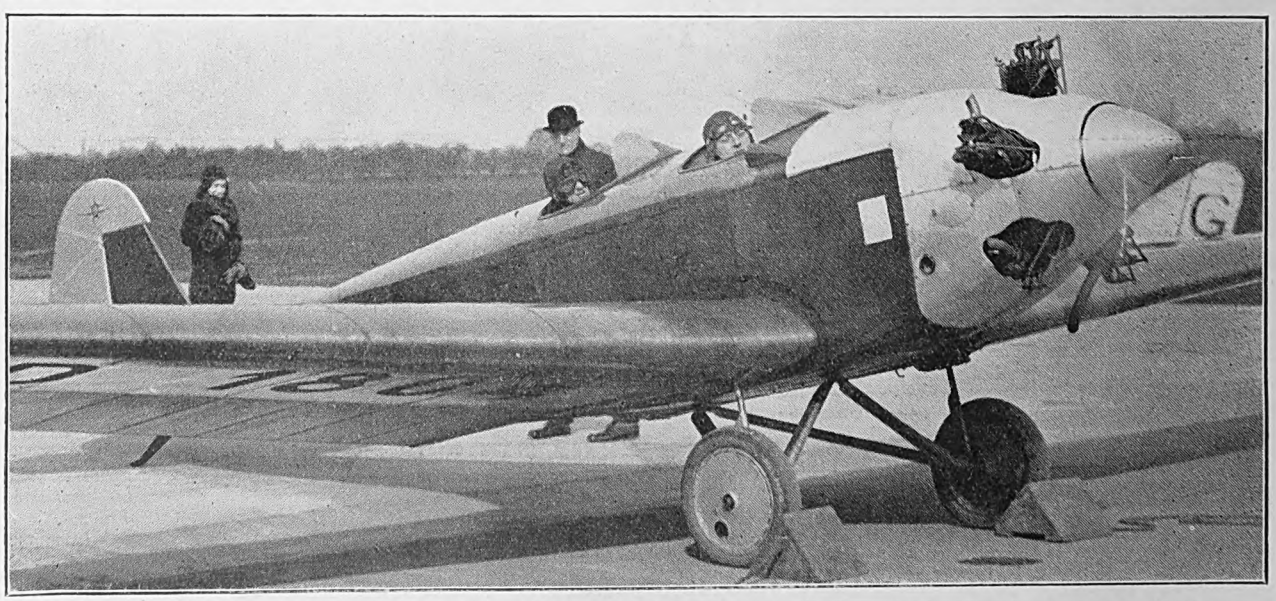
AN INTERNATIONAL OCCASION.

The registration of a new company with the name of International Aircraft Ltd. was reported in The Aeroplane of Mar. 26. This new company are the sole concessionnaires for Breda aircraft in Great Britain and have recently imported two Breda 15s. Both these machines have D.H. Gipsy engines.

To introduce themselves and the machines which they have to sell, International Aircraft Ltd. gave a kind of three days' party on Apr. 5, 7 and 8, to their friends, at the Olympia Garage which is being used as a showroom.

The Breda 15 is a light aeroplane of the enclosed-cabin high-wing monoplane type and was at the Olympia Aero Show of 1929. At Olympia the machine was shown with a 85 h.p. Colombo S.53 four-cylinder-in-line air-cooled engine. The design of the undercarriage has also been changed. This is now of the divided type with rubber-in-compression shock-absorbers and wheel-brakes.

One hears that an inverted engine will probably be fitted some time in the future and this should improve the forward view a lot. Another feature of the Breda 15, which is a



YET ANOTHER.—The Klemm Monoplane at Heston, with Siemens Motor,—This aeroplane seems to have been built with more different engines than ny other make.—(*"Aeroplane" photograph.*)

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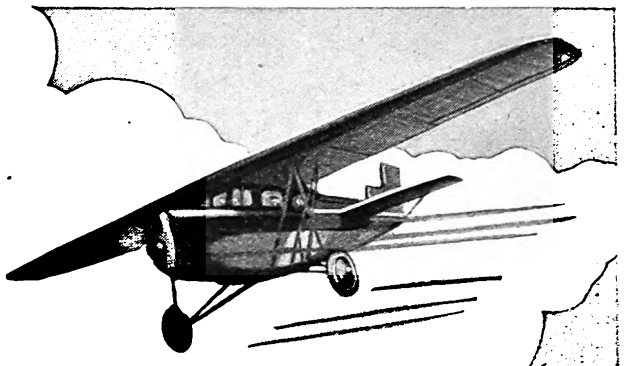

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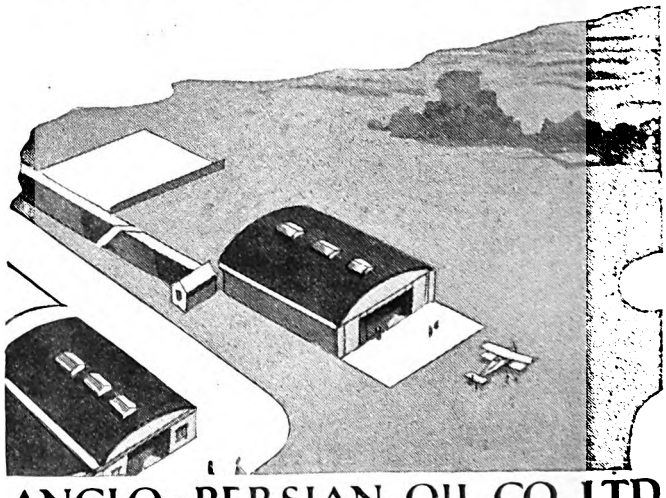

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COMMERCIAL AERONAUTICS.

THE GUILD OF AIR PILOTS AND NAVIGATORS.

The Guild of Air Pilots and Air Navigators of the British Empire have issued their first general report, covering the period from October 1929 to March 1930.

The Court of the Guild is composed as follows:—

Master.—Air Vice-Marshal Sir Sefton Brancker, K.C.B., A.F.C.

Deputy-Master.—Squadron-Leader Ernest L. Johnston, O.B.E., A.F.C.

Wardens.—O. P. Jones, A. G. Lamplugh, Norman Macmillan, M.C., A.F.C., A.F.R.Ae.S.; A. S. Wilcockson, Esq.

Members of the Court.—Flt. Lt. G. H. Allison, Lt. Cdr. N. G. Atherstone, A.F.C.; J. B. L. H. Cordes, Flt. Lt. H. D. Davis, F. Dismore, Ordre de Leopold II (Belgium); E. L. Hope, H. J. Horsey, E. A. Jones, Charles R. McMullin, C. A. Pike, A.F.R.Ae.S.; the Rev. P. Donald Robins, A.F.C.; Col. the Master of Sempill, A.F.C., F.R.Ae.S.; F. Tymms, M.C., Chevalier de l'Ordre de la Couronne, Croix de Guerre, A.F.R.Ae.S.; L. A. Walters, Sir Arthur Whitten-Brown, K.B.E.

Clerk.—Lawrence A. Wingfield, M.C., D.F.C.

Honorary Chaplain.—The Rev. P. Donald Robins, A.F.C.

Honorary Auditor.—Ernest Harry Wingfield, F.C.A.

The Guild nominally came into existence on Oct. 1, 1929. It arose out of the general desire expressed at an informal meeting of Air Pilots and Navigators held on Feb. 1, 1929. The preliminaries of drafting the rules and preparing a scheme by which a duly elected Court could be brought into existence which could in turn proceed to the election of members, were all matters requiring the greatest care and attention, and fully occupied the succeeding seven months.

For all the patient work involved therein thanks are due to so many that it would perhaps be invidious to mention names, but one is bound to record a tribute to the whole-hearted and loyal energy and foresight displayed by Sq. Ldr. E. L. Johnston, and to say that the existence of the Guild is very largely due to his efforts. One would also like to record appreciation of the good counsel and ready interest of our first Master, Air Vice-Marshal Sir Sefton Brancker, K.C.B., A.F.C., who, notwithstanding his innnumerable other activities, has always been ready to lend a sympathetic ear to pilots' difficulties.

The Election of the Court took place at the Meeting of the Foundation Council on Oct. 7, 1929, and can be said to be the first official act of the Guild's existence.

On Oct. 19, 1929, the ceremony of installation of the first Master, Deputy-Master, Wardens and Members of the Court was performed by the Chaplain and Clerk at the Hotel Cecil in the presence of the members of the Guild. This ceremony was followed by the inaugural dinner, at which 120 persons were present. Among the guests were many of the leading men and women in the Aircraft Industry and the Air Force. The principal guest was His Majesty's Under-Secretary of State for Air, Mr. F. Montague.

Six months have elapsed, and it is now possible to give a review of the work undertaken and accomplished during that period.

Committees.

The following Committees have been set up:—

Finance.—Sq. Ldr. E. L. Johnson (Chairman), O. P. Jones, H. J. Horsey, W. L. Hope, C. R. McMullin, Cdr. N. G. Atherstone, A. S. Wilcockson, the Rev. P. D. Robins, Norman Macmillan.

This Committee meets regularly each month prior to the monthly meeting of the Court.

Accident.—N. Macmillan (Chairman), A. S. Wilcockson, O. P. Jones, A. G. Lamplugh.

This Committee was appointed with the object of considering flying accidents from the pilot's point of view. No committee of inquiry has ever been held by Competent Air Pilots in the past, indeed the machinery for instituting such a committee did not exist.

The object of this committee is to determine whether the risk to life of pilots and passengers in air transport is unduly great, and what steps, if any, can be taken from the pilot's point of view to eliminate risks. It is not intended to examine any specific accident, but merely to collate the practical experiences of members. The committee is still sitting, and will report on or before June 30, 1930.

The Guild in Relation to Other Aeronautical Bodies.—It is of interest that a resolution was passed by the Royal Aeronautical Society on Nov. 19, 1929, approving the application of the Guild of Air Pilots and Air Navigators of the British Empire for recognition as the body primarily concerned with the welfare of Commercial Pilots. A similar resolution was shortly afterwards recorded by the Air League of the British Empire.

Legal Representation.—One of the most important matters that early arose for consideration by the Guild was the question of legal representation of the Guild and its members at inquests and courts of inquiry. It has been laid down that in the case of members, legal representation be taken by the Guild at all inquests and inquiries, and that in the case of non-members the Guild should be legally represented in all cases where it is conceived a point of policy or principle affecting the members of the Guild is concerned.

As it is sometimes necessary to take decision upon a matter of this kind with great urgency, the Master, Treasurer, and Clerk are empowered to incur a limited expenditure in the first instance without the consent of the Court.

Contravention of Air Navigation Regulations.—The attention of the Court was called to the fact that very often low flying over towns involving breaches of the A.N.R. was deliberately undertaken for commercial gain. One occasion in particular was reported, in which three different newspapers requested aerial pictures of the R.101 flying over London on Oct. 14, with the Thames and Houses of Parliament in the background of the picture. This request was declined by the member to whom it was made, upon the ground that this was a dangerous thing to do with a single-engined machine, and, furthermore, was strictly against the air navigation regulations in force. Nevertheless, another firm (not members of the Guild) took the pictures, which were duly published in the papers, to the financial disadvantage of the member concerned.

The Court expressed the view that such breaches were to the detriment of the Guild, as being calculated to bring the professions of Air Pilot and Navigator into disrepute, and communicated their view to the Air Ministry, expressing, on behalf of the members of the Guild, their desire to see the regulations strictly observed. The Air Ministry have now invited members to report to the Guild any cases of contravention of the regulations that may come to their notice. The registration markings of the aircraft should be noted to enable the machine to be identified and the Air Ministry will then take appropriate action.

Social Activities.—In January the Guild were able (through the courtesy of Mr. Alexander Duckham) to arrange for a private exhibition of M. Louis Bleriot's film, "25 Years of Aviation," which was attended by about 100 members and friends, and was greatly appreciated. Mr. Duckham has also expressed his desire to present the Guild with a "Loving Cup" to start its collection of plate. A suitable design has now been selected, and the Guild will receive the cup shortly.

Navigation Classes.—Through the enterprise of Capt. A. G Lamplugh the Guild has held throughout the winter a successful course of Navigation Classes. These classes have been so popular that many more applicants applied than could be catered for, and it has been found there is a widespread demand for similar classes in the provinces. Endeavours are being made to arrange to meet this demand.

The Court has recently had under review the whole question of present-day methods of education and training for Commercial Pilots, and has been asked to submit to the Air Ministry a memorandum embodying its views. It desires to record its grateful thanks to Capt. A. G. Lamplugh for all the work he has done in this connection.

Coat of Arms.—The question of an heraldic coat of arms for the Guild has been under consideration for some time, and a suitable design has been prepared and approved by the College of Heralds. Owing, however, to the expense entailed for the College of Heralds' fee (the total expenses are estimated at approximately £250) the matter has been left in abeyance for the time being.

Convention for the Unification of Air Transport, dated Oct. 12, 1929.—The Court has had under consideration the Convention above referred to, from the pilot's and navigator's point of view.

The Court are also considering certain proposals made by Dr. Herman Doring to the International Law Association, the chief of which is that in the event of temporary forced landings of international air transports the obligation of the pilot to communicate with the Customs authorities should be waived where the cause of the landing can be quickly located, and that in the event of longer delay the pilot, acting as representing the competent Customs authority, can effect a provisional Customs examination and seize

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such articles as in his opinion are subject to Customs duty. The Court expressed their approval of these proposals and informed Dr. Herman Doring and the International Law Association.

Renewal of B Licences.—Certain complaints of pilots with regard to the expense of outside medical consultation in connection with the renewal of "B" Licences have been made. The Court has taken the matter up and expect to be able to achieve an improvement from the pilot's point of view in this connection.

Associate Membership.—In February a committee was set up to explore the possibility of Associate Membership.

The committee recommended the proposal subject to limitations, which they mentioned. In considering the class of person to be admitted as an associate member, they thought that (a) he must be a British Subject; (b) he must be engaged in Commercial Aviation.

The committee were of opinion that the applicant should be definitely, though not necessarily, earning his livelihood as a pilot or air navigator.

They further recommended that an associate member should have no vote in the management of the Guild and should pay a subscription of £2 2s. per annum. The report of the committee came before the Court on Mar. 11. They, however, came to the conclusion that the time was not yet ripe, and resolved that the matter remain in abeyance for 12 months.

Pilots' and Air Navigators' Insurance Against Loss of Certificates or Licences.—The Guild has for some time past had under consideration the question of an approved policy protecting pilots and navigators against loss or suspension of their licences, and possibly their livelihoods. Such a policy would provide for weekly payments during suspension, and a lump sum in the event of the Secretary of State refusing to renew the licence.

The Guild are engaged, in conjunction with underwriters specialising in this class of insurance, in getting out an approved form of policy, and are assured that it will ultimately be available to members at a premium less than that payable by non-members for similar benefits. Further details will be issued in due course.

Income Tax.—The Guild has resolved to afford financial support to one of its members who, on behalf of himself and many other pilots, is fighting a test case. One of the principal contentions involved in the case, which is being brought against the member by the Crown by way of appeal from the decision of the Special Commissioners already given in the member's favour, is the question of allowance of the cost incurred by a pilot for running of motor-car to get him to and from his place for starting work.

The contention of the pilot is that he cannot be said to have his place of business at any particular aerodrome, seeing that all aerodromes served by the air line employing him are equally places of business. His case, therefore, being different from that of an ordinary employee (who has a fixed place of business), and a motor-car being essential by reason of his never knowing when he may be called upon to start work, the cost of his motor-car ought to be allowed for income tax purposes.

While this question probably affects only pilots employed by an air line, the Court have considered it of sufficient importance to justify their support. There are also involved in the case several other questions of even more general application to pilots.

Fifth International Air Congress at The Hague.—The Guild has been invited to send delegates to this Congress. It is greatly hoped that a member or members will read papers upon the subject of air transport from the pilot's point of view, and the Master is of opinion that such a paper would be of great value.

The papers must be submitted to the Secretary-General of the Congress on or before April 30, 1930, and any member willing to do so should communicate with the Clerk to the Guild as soon as possible.

Endowment Fund.—The Court has resolved to set up an endowment fund, with the object of—

(a) Charitable assistance to widows and orphans of members in cases of need.

(b) To provide the Guild with an income independent of subscriptions.

(c) To provide for legal representation of the Guild and members at inquests and courts of enquiries into air accidents, Parliamentary enquiries, etc.

A donation of £50 has already been received.

THE AIR SURVEYORS.

On Apr. 7, Mr. and Mrs. Alan Butler reached Broken Hill, Northern Rhodesia. On April 10 they reached Bulawayo and on April 11 continued their journey to Cape Town whence they will "roll down to Rio,"—by ship.

Major Cochrane Patrick will bring the machine back from Cape Town for the survey of Northern Rhodesia.

Apparently Mr. and Mrs. Butler had a few mild excitements. At Juba, while a punctured tyre was being repaired, a gust of wind blew the machine off the jack and broke the axle drum.

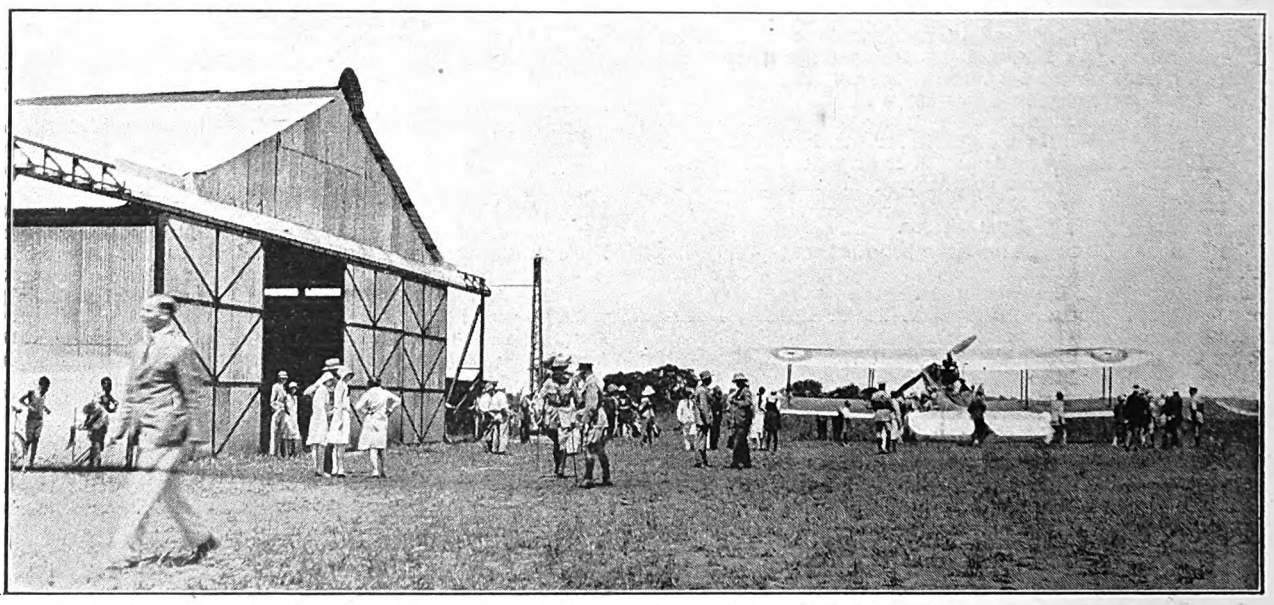
On Apr. 13 Mr. and Mrs. Butler landed at Pretoria.

A BIG STEP FORWARD.

The Postmaster-General announces that a night air-mail service between London and Brussels will start on the night of Apr. 14. The service will run nightly except on Saturdays and Sundays. The latest time of posting at the London G.P.O. will be 23.00 hrs. The mail reaches Brussels in time for the first delivery.

All classes of postal packets (except parcels) may be sent. Registration, but not insurance, is admitted.

An air fee of 2d. per ounce must be prepaid, in addition to ordinary postage.



A HOME FROM HOME.—This shows a complete aeroplane shed supplied by Boulton and Paul Ltd. of Norwich to the Aircraft Operating Co. Ltd for their base at Bulawayo from which they will work during the extensive survey of Rhodesia for which the A.O.C. has recently contracted. Boulton and Paul Ltd. specialise in this class of building and have already supplied a number of similar buildings in the Overseas Dominions. The price of such a shed is just about half the price of a wooden shed covered with fabric. There is interest in noting that Boulton and Paul's have also supplied two complete sets of motors-cum-dynamos to the Aircraft Operating Company. These are used in their various camps both for lighting the camps and for charging accumulators for long range radio work. Many sets of similar electric equipment have been sold in South Africa and Australia.

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NEWSPAPER TRANSPORT IN FRANCE.

A new company, known as the *Société de Transports Aériens Rapides* (Star) has been formed in France to carry newspapers from Paris to the coastal resorts on the North Sea, English Channel and Atlantic coasts.

Eight pilots have been engaged, with M. Denis, formerly of Air Union, as Technical Director and Chief Pilot. The equipment of the company consists of seven Nieuport-Delage 641 cabin monoplanes (240 h.p. Lorraine engines) and three Fokker F.VII monoplanes (450 h.p. Lorraine).

This company does not receive any subsidy from the French Government,—which is a hopeful sign for Commercial Aviation in France.

THE LATEST IRVIN AIR CHUTE.

The parachute was originally developed for use in conjunction with open-cockpit military aircraft. With the growth of civil aviation this use was expanded to embrace open-cockpit civil aircraft.

The Irving Air Chute Co., Inc., of Buffalo, N.Y., has progressively increased its sales of Air-Chutes to civil users and the number of lives saved has kept pace with their sales.

In 1924 only one-half of one per cent. of their production went into civilian use, but eleven more lives were saved that year including one civilian.

In 1928 12 per cent. of their production went into civilian use. Sixty-three lives were saved that year and of these seven, or about 11 per cent., were civilians.

In 1929 their sales for civilian use were 28 per cent. of their total sales, and 102 lives were saved of which 28, or approximately 27½ per cent., were civilians.

Readers should not regard these figures as indicating the dangers of civil flying, for practically all the civilians who took to their parachutes were either test pilots trying out experimental machines or else American air-mail pilots who abandoned their machines when lost in fog or snow-storms. One knows of no instance of a private owner having to use a parachute in this country.

The question of the use of the parachute from cabin or enclosed cockpit aircraft has given rise to much argument. The difficulty of getting through a cabin door particularly when more than two or three people wearing the standard free type parachute are required to leave the machine in an emergency has always been present. In a multi-seat cabin aeroplane as much room as possible has to be saved without cramping the accommodation and so long as a passenger has had to wear a seat pack the introduction of this life-saving device to closed aircraft has been handicapped.

Recent tests in the United States showed that twelve men could leave a Ford monoplane in ten seconds. This was conducted by the U.S. Army and was done obviously by an experienced parachute jumpers from an unencumbered cabin under ideal conditions. Nevertheless it did prove that the parachute could be used from cabin aircraft or from any craft in which parachutes cannot be comfortably and conveniently worn all the time.

About two years ago the Irving Air Chute Co., began to develop a type of Air Chute which would be particularly applicable to cabin aircraft.

This parachute has now been perfected and is known as the Quick-Connection Air Chute. This Air Chute was first introduced in England by the Irving Air Chute of Great Britain Ltd., of Letchworth, for specialised use in the R.A.F. by observers to whom a seat pack would be inconvenient when standing up and operating the guns of a war machine.

Its design and arrangement make it particularly applicable for use in cabin aircraft. The parachute pack and the harness are not permanently connected. The harness, which is worn as usual, does not differ essentially from the usual Irvin Air Chute harness either in material or design, except that suspended from the shoulders of the wearer in front, to lie slightly above the waist, are two safety-hooks or snaps.

The parachute pack is a separate unit and is carried in a rack or on hooks, either in the cabin or cockpit within arm's reach of the person who may wish to use it.

On the parachute pack are two small metal bars about an inch and a half long the same distance apart as the snaps on the harness.

To connect the two it is only necessary to press the pack against the breast so that the two metal bars click into the two safety snaps. Once in they cannot be removed unless the safety catch which is held in place by a light spring is released.

The metal bars are attached to the parachute pack by metal plates which also form the attachment for the shroud lines. These shroud lines are continuous and pass from one anchorge up to the chute, over the chute down the other side to the other anchorage and then back to the first one.

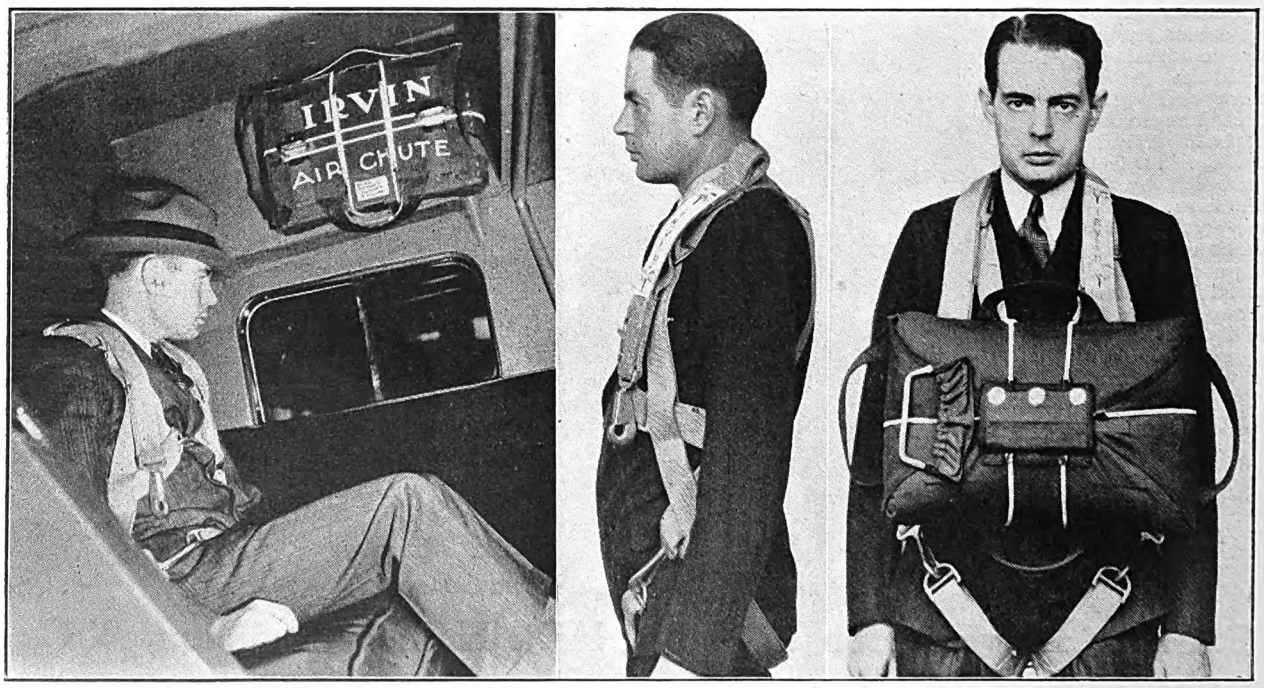
The result of this is that if in excitement the user of the parachute fails to connect the pack to the harness by both snaps but only by one, the chute will function with as much efficiency and just as safely when once the rip-cord is pulled.

In riding down to earth the harness will not feel so comfortable if only one snap is connected, but the safety factor is just as great and the chute will open just as quickly.

Each of the four edges of the canvas pack cover is fitted with a canvas handle which is made so that it projects out from it. It can be carried and handled by any one of them. The chute is operated in the usual manner by a jerk on the rip cord, which has a particularly large ring to make it easy to find and grip.

The Irving Company has also introduced a different type of Air Chute for the air traveller. This type fits the wearer's back and acts as a soft cushion for the back of the seat. It is a much thinner pack than the ordinary pack and the chute inside is spread out to make it soft and pliable for the shape of the back.

When the passenger enters the aircraft and sits down he merely slips his arms through the parachute harness to be ready for an emergency. If he leaves his seat during the flight he is not obliged to carry the parachute, which remains on the seat fulfilling its function as a cushion.



THE LATEST IRVIN AIR CHUTE.—Three views showing, on the left, the Quick-Connector Air Chute ready for use in an aeroplane cabin, and on the right, the harness with and without the Air Chute pack attached.

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SPARTAN AIRCRAFT

105/115 H.P. CIRRUS HERMES ENGINE

Light aeroplanes of robust construction and high performance. Prices from

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"SAFETY IN THE AIR——EVERYWHERE."

WEAR AN IRVIN AIR CHUTE.—

In accidents it will decide that you are going to meet "YOUR FRIENDS, NOT YOUR ANCESTORS."——

THE INTERNATIONAL CATERPILLAR CLUB has now over 257 members, composed as follows:—

England 33, America 197, Poland 13, Russia 3, Sweden 4, Canada 2, Denmark 2, Siam 1, Japan 1, Argentine 1.

All these lives were saved by IRVIN AIR CHUTES.

IRVIN AIR CHUTES are used by 30 Governments, including Great Britain and Colonies, U.S.A., Belgium, Spain, Russia, Poland, Sweden, Norway, etc.

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IRVIN THE LIFE PRESERVER ——OF THE AIR——

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Telephone: Letchworth 370.

Telegrams: Irvin, Letchworth.

Our film "Happy Landings" in standard width film, illustrating actual operations of the Irvin Air Chute, available free of charge for Clubs, etc.

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A HAPPY ENDING.

The K.N.I.L.M. (Royal Netherlands-Indies Air Line) have received permission from the Indian Government to use various aerodromes in India from Oct. 1. Therefore from that the K.N.I.L.M. will begin fortnightly flights to the Dutch East Indies.

About a year ago the K.N.I.L.M. were allowed to use the aerodromes for a number of experimental flights but could not obtain permission for a regular air service. The reason given was that the aerodromes were still being constructed.

ITALIAN ENTERPRISE IN BULGARIA.

The Caproni firm, of Italy, have acquired a large aircraft factory in Kazanlik, Bulgaria, and with it the exclusive supply of aeroplanes to the Bulgarian State. The factory had originally been in the hands of a Czechoslovak firm.

CASTROL IN CANADA.

The most northerly and one of the most difficult air lines in the world is being operated by Commercial Airways Ltd. of Edmonton, Alberta. The 1,800 mile run down the Mackenzie River from Fort McMurray, Alberta, to Aklavik on the Arctic Ocean, covers some of the most difficult territory conceivable, barren wastes alternating with thick forests. Six-seater Bellanca Monoplanes are used, with 300 h.p. Wright Whirlwind engines, lubricated with Castrol.

Canadian Wright Ltd. state that one of these motors, which had done nearly 200 hours, partly when the temperature was 60° below zero, "could easily have done double the time without having to be stripped down."

Castrol is also used by the Royal Canadian Air Force. Supplies are cached in the northlands and are used for the operations of their photographic patrols.

A WAY THEY HAVE.

The Ordinary General Meeting of Handley Page Ltd. was held on April 8 at Winchester House, Old Broad Street, London, E.C. The Chairman of the company, Mr. S. R. Worley, F.C.A., was in the chair.

He said, in moving the adoption of the report, that during the year under review that the British Government had made a first payment of £68,000 on account of the £100,000 which was the price of the rights for the slotted wing. But from this payment income-tax amounting to £13,600 was deducted.

ANOTHER COMPRESSION-IGNITION ENGINE.

From statements which have appeared in the daily Press, the Pratt and Whitney Aircraft Co. seem to be the latest aero-engine firm to disclose the results which they have obtained with compression-ignition engines.

Apparently, the fuel system, which is of the injection type, has been so arranged that the engine can be changed over from petrol to heavy oil. Indeed the chief advantage which is claimed for the engine is that it has no carburettor.

BRIAN LEWIS AND C. D. BARNARD LTD.

Brian Lewis and C. D. Barnard Ltd. has been formed by Mr. Brian Lewis and Mr. C. D. Barnard to sell aircraft and every aspect of service to the private owner. This company supersedes the aircraft sales side of Malcolm Campbell Ltd. and will deal in aircraft only.

They have showrooms at Heston, where there is a ground engineer and salesman. Demonstration and trial flights can also be made there. This firm will not only sell machines but teach people to fly. They will organise special flights and do all the necessary ground organisation, arranging for fuel and the like, also the preparation of maps and a suitable route. In fact, not only will they provide a client with a suitable aeroplane, but they will see he gets the best out of it.

THE WESTLAND AIRCRAFT SOCIETY.

Under the chairmanship of Mr. V. S. Gaunt, A.M.I.Ae.E., Mr. T. S. Duncan, of Vickers (Aviation) Ltd., delivered on Mar. 27, before the members of the Westland Aircraft Society, a lecture on the subject of "Aircraft Accessories." With lantern-slides Mr. Duncan explained in detail drawings of petrol and oil-cocks, Vickers-Potts oil-coolers, petrol pumps (wind-driven and hand-operated), Vickers patent oleo shock-absorbers of all sizes from 200 lbs. to 1,300 lbs., and Vickers patent aero brakes (hydraulically operated).

Immediately following the lecture a film showing models of various types of aircraft under test and a tour of the Vickers Works was exhibited.

The interest in the subject was apparent by the resultant discussion.

Mr. J. Johnston, proposing a vote of thanks to the lecturer, recalled his association with Vickers Ltd. in the early days. He was gratified to know that Vickers activities had so grown as to warrant the formation of a special department to deal solely with Aircraft Accessories.

THE ACCIDENT AT LIMPSFIELD

The inquest upon the bodies of Karl Wessel, the pilot, and Gustav Ferdinand Konnert, the mechanic, of the Luft Hansa machine which crashed at Limpsfield on April 9, was held at Oxted.

After hearing four witnesses who were on the spot soon after the accident, the Coroner said that there was no evidence to show the cause of the crash. He thought that it was possible—and Major Cooper (Inspector of Accidents, Air Ministry) agreed with him—that there had been some engine defect and that the pilot was trying to find a landing place. He had probably come down closer to the ground than he realised, and the roar which the engine made seemed to indicate that he had accelerated as if to rise. That might be the explanation of the crash, although it was only a theory. Major Cooper was going on with his examination, and the experts would try to find the cause of the accident. He did not think it was necessary to adjourn the inquest, and he thought the jury would be satisfied that it was an accident.

The jury returned a verdict of "Accidental death," and commended Huntley and Manktelow for the assistance they rendered. They also expressed sympathy with the relatives of the dead pilot and mechanic.

THE LONDON TERMINAL AERODROME.

ANALYSIS OF FIGURES FOR PAST WEEK.

Trips per Day.—Sunday, 10; Monday, 21; Tuesday, 22; Wednesday, 22; Thursday, 21; Friday, 24; Saturday, 22.

Imperial Airways Ltd.:
London—Egypt—India: London—Le Touquet—Paris—Basle—Zurich: London—Ostend—Brussels—Cologne and return: Machines 43, passengers 425, freight 19¾ tons. India Route: Inward, passengers 0, mail 617 lbs.; outward, passengers 2, mail 853 lbs.

Air Union:
Paris—London: Machines 41, passengers 143, freight 10¾ tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 20, passengers 72, freight 9¼ tons.

Sabena:
Brussels—London: Machines 12, passengers 39, freight 3¼ tons.

Deutsche Luft Hansa A.G.:
Amsterdam—London: Machines 26, passengers 42, freight 5¼ tons.

Miscellaneous:
British machines 0, passengers 0.
Foreign machines 0, passengers 0.
Total number of trips by British machines, 43, carrying 425 passengers. Foreign machines, 99, carrying 296 passengers.

COMPARATIVE FIGURES.

Week ending April 12:
Machines, 142; Passengers, 721; Crews, 388; Total personnel, 1,109.
Corresponding week, 1929:
Machines, 140; Passengers, 826; Crews, 280; Total personnel, 1,106
Corresponding week, 1928:
Machines, 129; Passengers, 817; Crews, 255; Total personnel, 1,072.
Corresponding week, 1927:
Machines, 89; Passengers, 516; Crews, 150; Total personnel, 666.
Corresponding week, 1926:
Machines, 89; Passengers, 461; Crews, 116; Total personnel, 577.
Corresponding week, 1925:
Machines, 102; Passengers, 419; Crews, 131; Total personnel, 550.
Corresponding week, 1924:
Machines, 39; Passengers, 163; Crews, 59; Total personnel, 222.
Corresponding week, 1923:
Machines, 96; Passengers, 366; Crews, 156; Total personnel, 522.
Corresponding week, 1922:
Machines, 75; Passengers, 211; Crews, 128; Total personnel, 339.
Corresponding week, 1921:
Machines 53; Passengers, 179; Crews, 69; Total personnel, 248.
Corresponding week, 1920:
Machines, 36; Passengers, 32; Crews, 36; Total personnel, 68.

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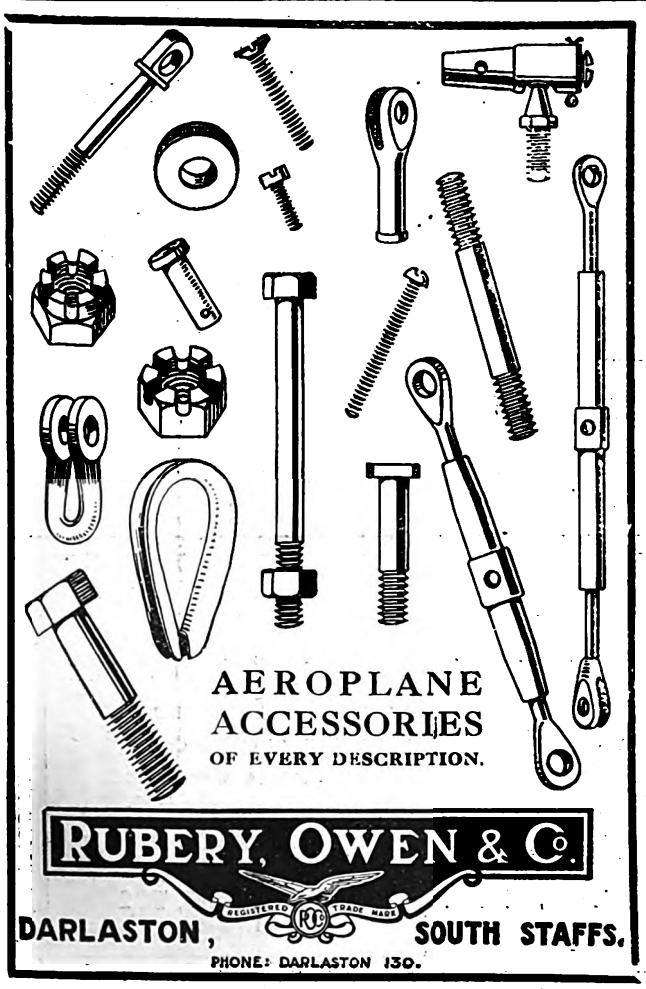

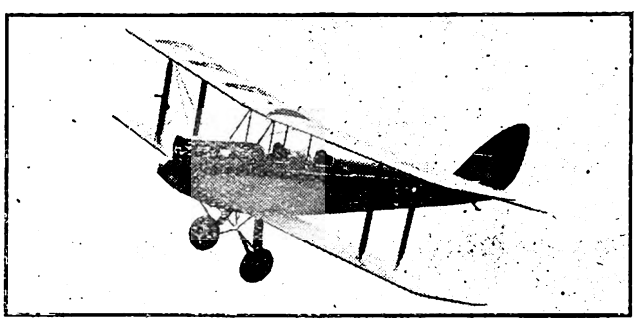

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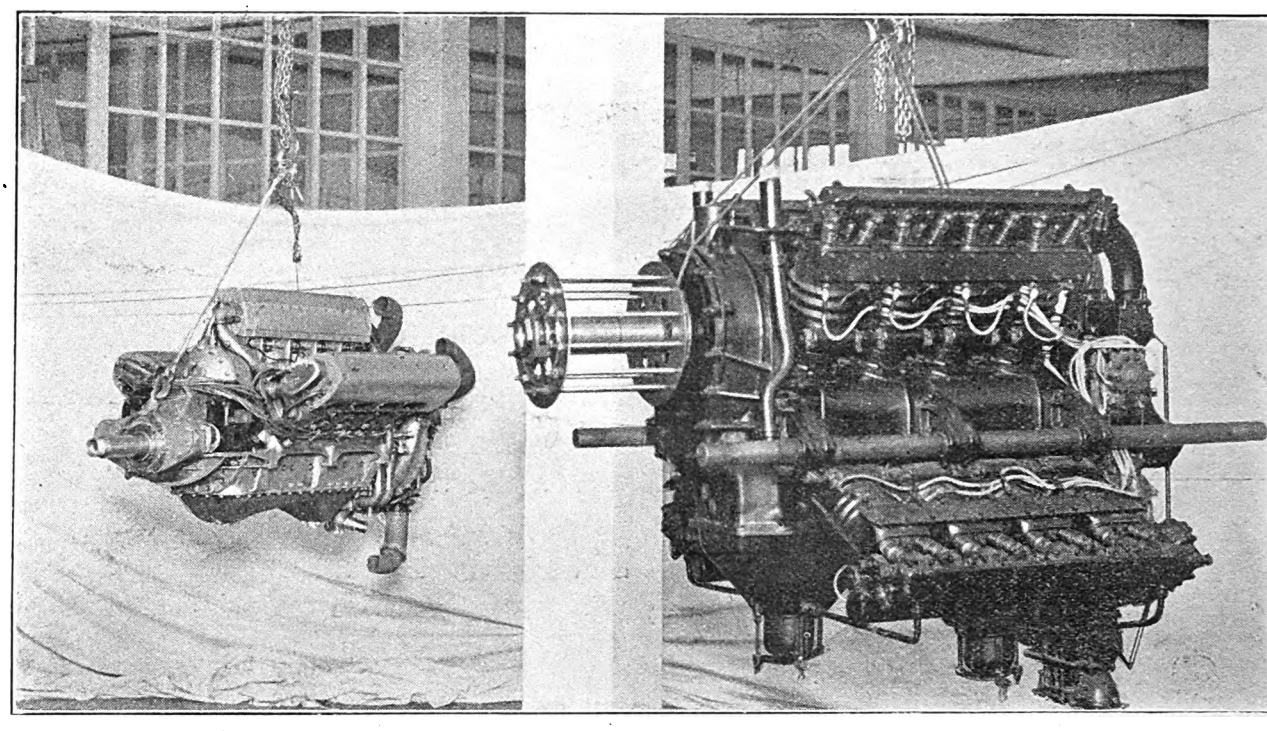
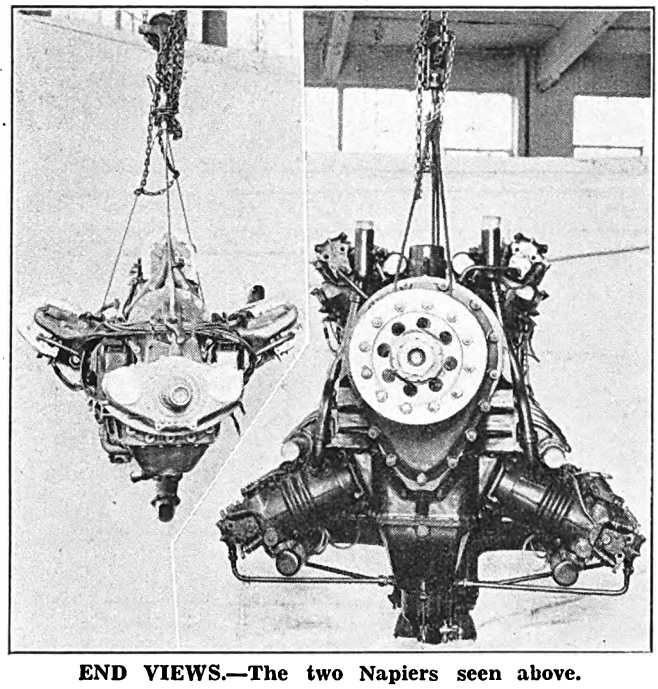


THE BIG AND LITTLE OF IT.—Left, the Napier Racing engine, which beat the World's Speed Record, after the Schneider Contest, and right, the Napier Cub, of four or five years ago. As the chains in the photograph show, they are seen almost to scale, yet the small one gives 1,275 h.p. against the 1,000 h.p. of the big one.



END VIEWS.—The two Napiers seen above.

USEFUL ALUMINIUM DATA.

The British Aluminium Co. Ltd. issue a very handy booklet under the title Aluminuim Foundry Data. This small work of reference contains everything that anybody could want to know about aluminium and its alloys.

The first pages describe the Physical Properties of the metal and name the responsible authorities, next come the dimensions in which the raw material is supplied as standard notched bars, as ingots, as rolling slabs, ground billets, and the like. Specifications of the various alloys are then given, together with their particular properties.

A number of pages are devoted to photographs which illustrate the variety of uses to which aluminium and its alloys can be put,—from components of a Schneider Trophy engine to "cards" used in the worsted industry.

The remainder of the booklet, and by far the largest portion of it, is devoted to Shop Practice. The matter here ranges from the choice of a furnace for melting to methods of getting the best matt finish. The best foundry practice is described, and much advice about machining is given. There is even a hint for the house-wife to the effect that although aluminium utensils are sold with the advice "use no soda," they can be so scoured providing the solution is not allowed to stand and a washing with clean water follows.

This little book is full of useful information for those who have to use, or design for the use of, aluminium,—and who in the aircraft industry does not? One advises all such people to write and ask the British Aluminium Co. Ltd., Adelaide House, King William Street, E.C.4, to send them a copy.

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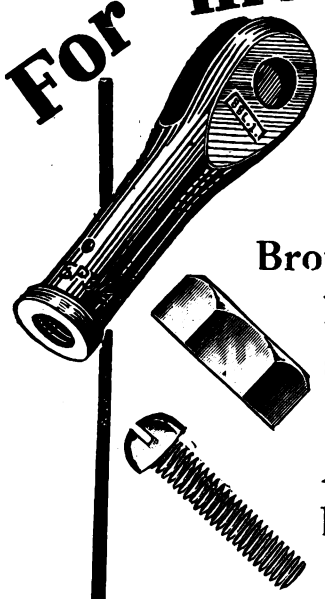

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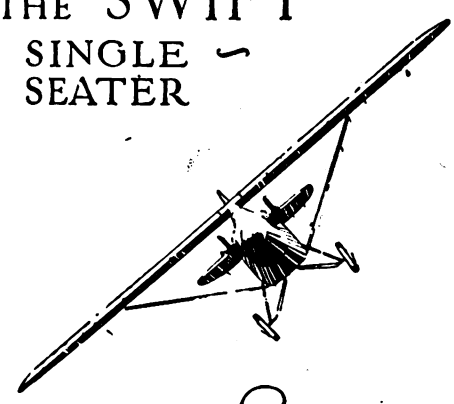

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A NEW COMPASS FOR LIGHT AEROPLANES.

An interesting light aeroplane compass has just been introduced in this country by E. F. Stephen, of 141, Bond Street, who will be the sole concessionnaire for this country. This is known as the "ZN" Compass, and the German makers, Zürd, Jackenkroll and Co., claim for it that it is a definite improvement on existing compasses in that it is non-periodic rather than aperiodic.

That is to say, by careful design it has been possible to make the value of the magnetic moment so large in proportion to the moment of inertia that only a comparatively small amount of damping is necessary to eliminate oscillation. As a result the indication of the compass, although steady, is unusually rapid. For instance the makers claim that after a displacement of 45° the compass card will show a steady bearing in less than 5 seconds.

By the use of Elektron it has been possible to reduce the weight to 11 ounces. As it sells at ten guineas complete, this is the lowest-priced compass for light aeroplanes on the market and should meet the needs of private fliers for a light inexpensive compass which is nevertheless reliable.

There is also a Mark II model costing £1 extra, which is recessed into an aluminium panel, which can be screwed into the dash, so that the whole makes a very neat and inconspicuous fitting. The concessionnaire will send a folder describing the compass on request.

PERSONAL NOTICES.

Deaths.

ARMISON.—On April 10, at Eastchurch, as the result of a flying accident, Telegraphist James Ronald Armison, R.N.

TEALE.—On April 8, at Duxford, Cambridge, as the result of a flying accident, Roger Pridgin Teale, Flg. Off., No. 19 (Fighter) Squadron, R.A.F.

Mr. Teale passed out of the R.A.F. College, Cranwell, in December 1926 and was posted to No. 19 (Fighter) Squadron. He was a qualified signals officer.

WILSON.—On April 10, at Eastchurch, as the result of a flying accident, Ernest Leonard Wilson, Flg. Off., R.A.F.

Mr. Wilson entered the R.A.F. with a short-service commission in November 1925 and after a course of flying training at No. 1 F.T.S., Netheravon, he was posted to No. 2 (Army Co-operation) Squadron. He served in China with the Squadron when it was part of the Shanghai Defence Force. He was promoted to Flying Officer in July 1927 and in September 1929 he was posted to the Armament and Gunnery School, Eastchurch.

Forthcoming Marriages.

WISEMAN-CLARK—PEMBERTON.—The marriage arranged between Flt. Lt. F. W. Wiseman-Clarke and Miss Cynthia Pemberton will take place at St. Paul's, Knightsbridge, on April 26, at 2.30 p.m.

WHITE—RITCHIE.—The engagement is announced between Flt. Lt. Frank Leslie White, R.A.F.M.S., elder son of Dr. and Mrs. F. H. White, London, and Helen Reoch, only daughter of Mr. and Mrs. D. H. W. Ritchie, Dura, Cupar, Fife.

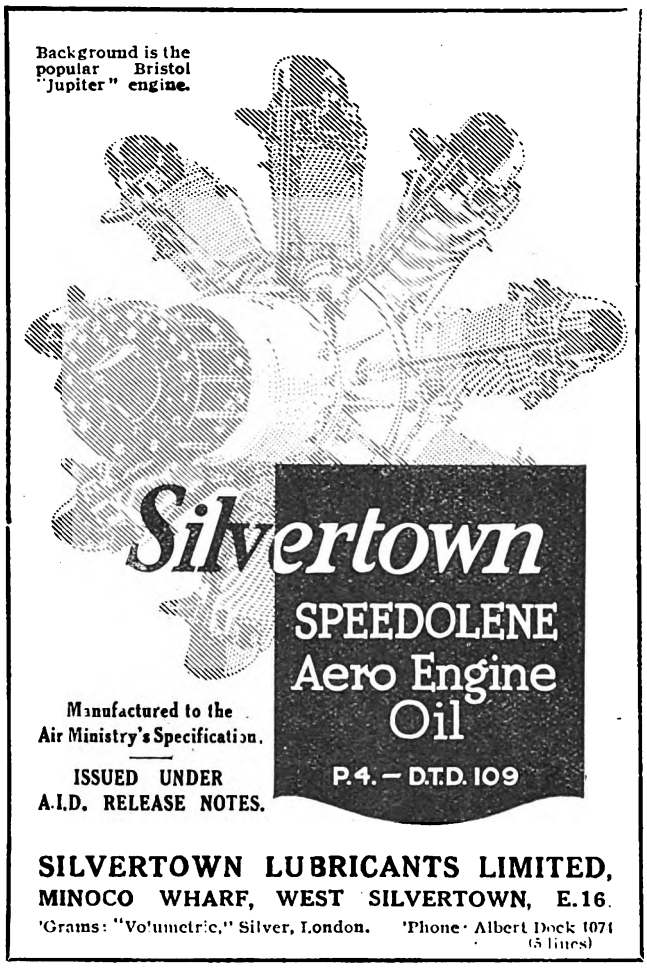
Marriage.

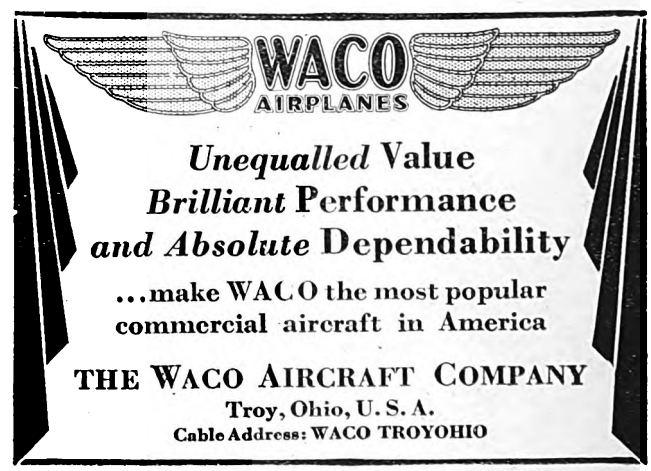
HOPE—BALFOUR.—On April 12, at Ranmoor Church, Sheffield, Flt. Lt. Eustace Jack Linton Hope, A.F.C., R.A.F., son of the late Major Linton Hope and Mrs. Hope, of Kingshott, Fernhurst, Sussex, to Evelyn Hope, daughter of Sir Arthur and Lady Balfour, of Ropes, Fernhurst, Sussex, and Riverdale Grange, Sheffield.

Births.

BAILEY.—On April 7, at St. Quentin, Stow Park Circle, Newport, Mon., to Margaret (*née* Davies), wife of Capt. George Buchanan Bailey, D.F.C.—a daughter.

TRUSK.—On Mar. 31, at Hitchin, to Winnifred, wife of Flg. Off. C. W. L. Trusk, A.F.C., R.A.F.—twin daughters.





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D. W. Aircraft Co., Brooklands Aerodrome; have for sale several S.E.5as, reasonable figure, new condition with C. of A. Telephone, Byfleet 331.
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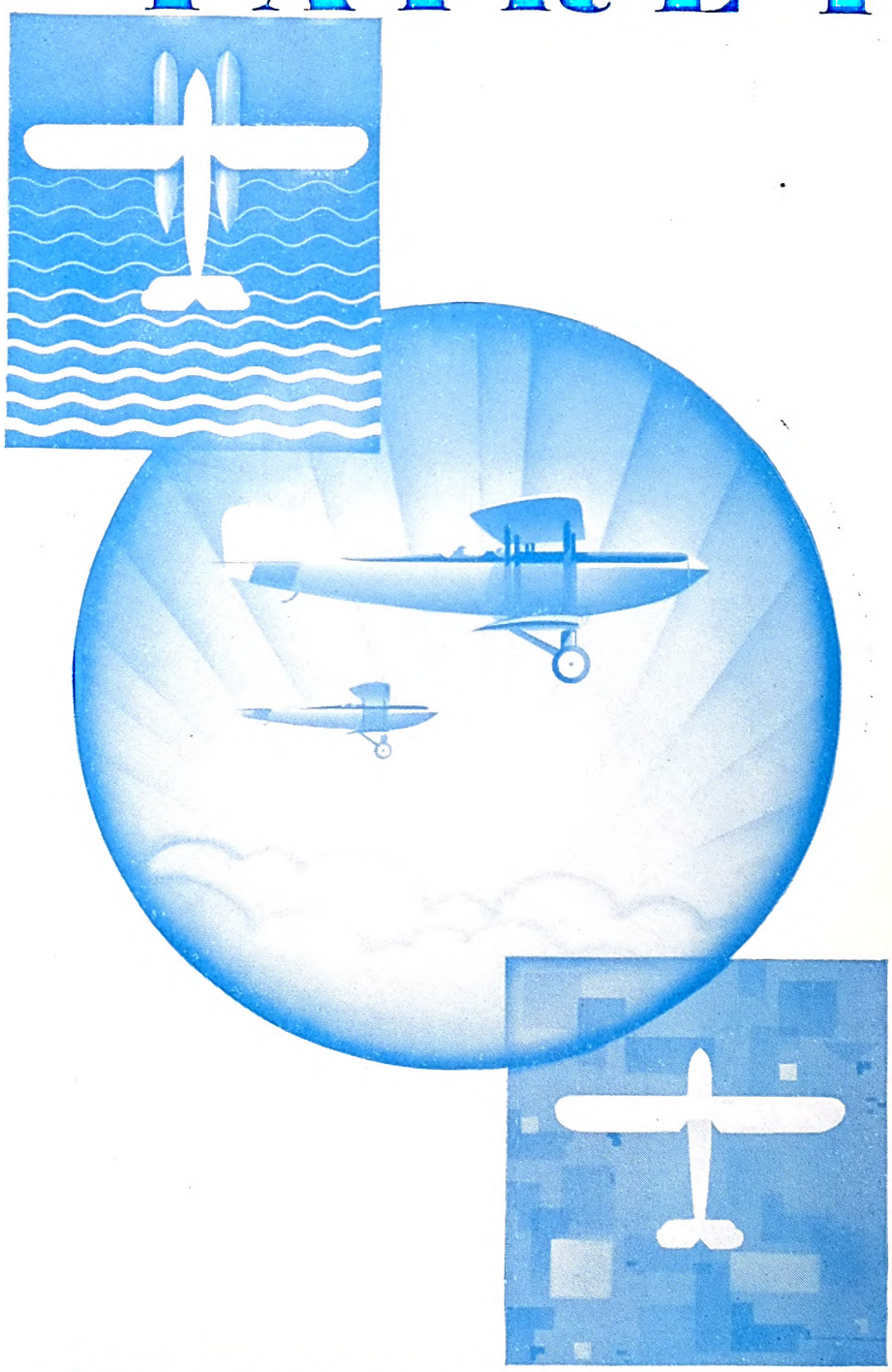

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THE AEROPLANE

Incorporating Aeronautical Engineering

VOL. XXXVIII No. 17.

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ON THE IMPORTANCE OF PORTUGAL.—III.

Some New Ideas for the Atlantic Crossing.

Through the courtesy of friends in Lisbon one had the honour of meeting Admiral Coutinho, who kindly presented to The Aeroplane a copy of his treatise on Navigation and of his description of his voyage across the Atlantic,—which are now treasured in our archives.

Admiral Coutinho is as convinced as any of us can be about the need for regular Air Mail Lines across the Atlantic. But he has his own ideas about how those lines should be run,—at any rate at first, until we arrive at the stage of having really big flying-boats which can carry mail and passengers at a speed which is worth while.

The Admiral, whose ideas on aviation are thoroughly up-to-date,—far more up-to-date in fact than are those of the people to whom our Government has committed the task of developing our Imperial airways—is convinced that the right way to run air mail across the Atlantic is by real high-speed machines built to carry mail and nothing else. As he rightly pointed out, the weight of a passenger transformed into petrol means alternatively either much longer range or much greater engine power and speed.

His idea is that the machines should not be flying-boats at all, but that they should be ordinary aeroplanes with fuselages built boat-fashion, so that if they are forced to come down in the sea by engine trouble, they will float, at any rate as long as any ordinary flying-boat would float, though they would not get off again. And, naturally, he insists that such machines should be fitted with transmitting radio, so that if forced down they can call for help and indicate their whereabouts in the ocean.

Apart from that he believes that these machines should be launched from a catapult and should alight on prepared platforms like the flying-deck of aircraft-carrying ships. In the light of his great knowledge of the South Atlantic, he claims that the ordinary flying-boat of to-day cannot use the South Atlantic islands as stopping-places.

He says that there is far too much swell at almost all times of the year at Madeira, and at Teneriffe, in the Canary Islands, and at St. Vincent in the Cape Verde Islands, to allow of flying-boats being properly handled close up to the shore, and unless there happens to be a wind in the right direction they cannot get off the long rolling swell. He remarked that de Pinedo,—who, he said, is a very clever man,—had great difficulty in getting his Savoia off the water at one of these islands.—But one may remark that the twin-hull Savoia was notoriously bad in getting off except against the right sort of wind on the right sort of water.

Admiral Coutinho's idea is, therefore, that there should be regular alighting places, with catching gear and with catapults for starting the machines off again, at certain points on the Islands. This idea seems quite practicable.

Catapults ought not to be very expensive machines to build, although probably those used in the British Navy cost approximately ten times what they would cost if they were built by contract by ordinary commercial engineering firms. And an alighting place with catching gear ought not to cost, in fact, anything like as much as levelling and draining ordinary land for an aerodrome.

If this system were adopted, there would be the possibility of building such a station on the famous Rocks of St. Peter and St. Paul, which are practically midway between the Cape Verde Islands and the coast of Brazil. These rocks at present are quite useless for anything other than a mark by which a doubtful navigator may locate his position. And they are a danger to such doubtful navigators on the water if the said navigators happen to have lost their way in the dark. But, as the accompanying picture shows, there is plenty of material on which to build a landing and launching platform.

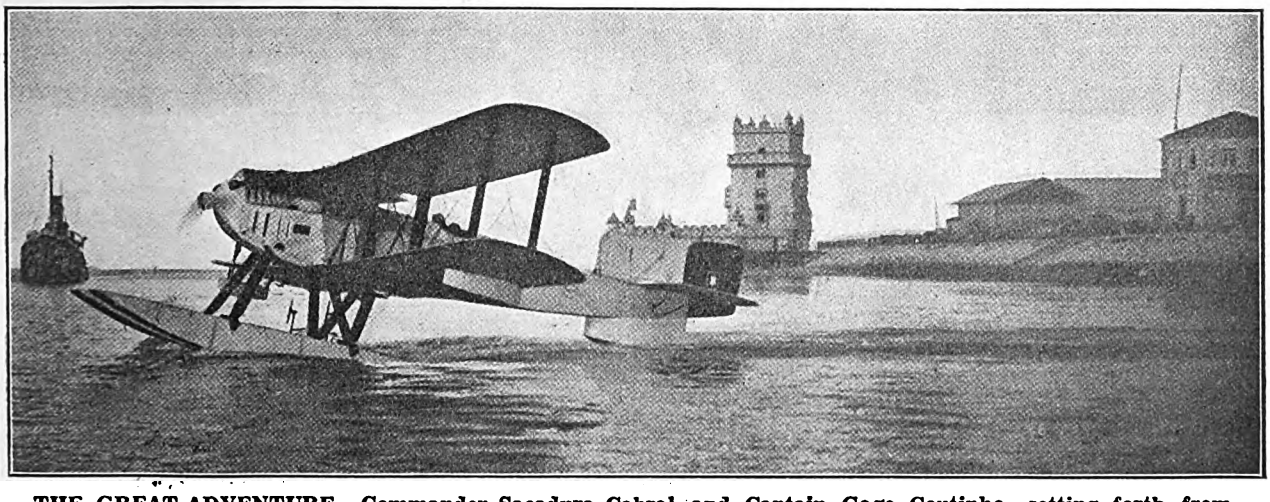
This system of running the air mail in comparatively small and comparatively cheap high-speed mail-carrying aircraft, as advocated by Admiral Coutinho, would probably be a much cheaper way of starting the service—which *we* ought to be running—than any other. Thirty or forty such machines, plus the cost of the landing platforms and the catapults, would probably cost actually less than the great fleet of mail-plus-passenger machines which have been built and are being maintained by the *Compagnie Aéropostale* whose operations were described in The Aeroplane three weeks ago.

To Our High Financiers.

Therefore, one commends Admiral Coutinho's recommendations to such big business men and high financiers in this country as may, sooner or later, have the intelligence and initiative to start an air mail line for the benefit of British commerce and for their own ultimate profit. If a thoroughly efficient air mail line on the principles advocated by Admiral Coutinho were put into operation between London and Buenos Aires it would soon begin to pay for itself.

Obviously the people who ought to start running such a line are the shipping companies who at present hold the mail contracts. If somebody could form a kind of merger, purely on the aeronautical side, of the Royal Mail Steam Packet

"IN A JUST CAUSE IT IS RIGHT TO BE CONFIDENT."—(*Sophocles.*)



THE GREAT ADVENTURE.—Commander Sacadura Cabral and Captain Gago Coutinho, setting forth from Bom Sucesso in their Fairey III.D (Rolls-Royce Eagle), to fly the South Atlantic.

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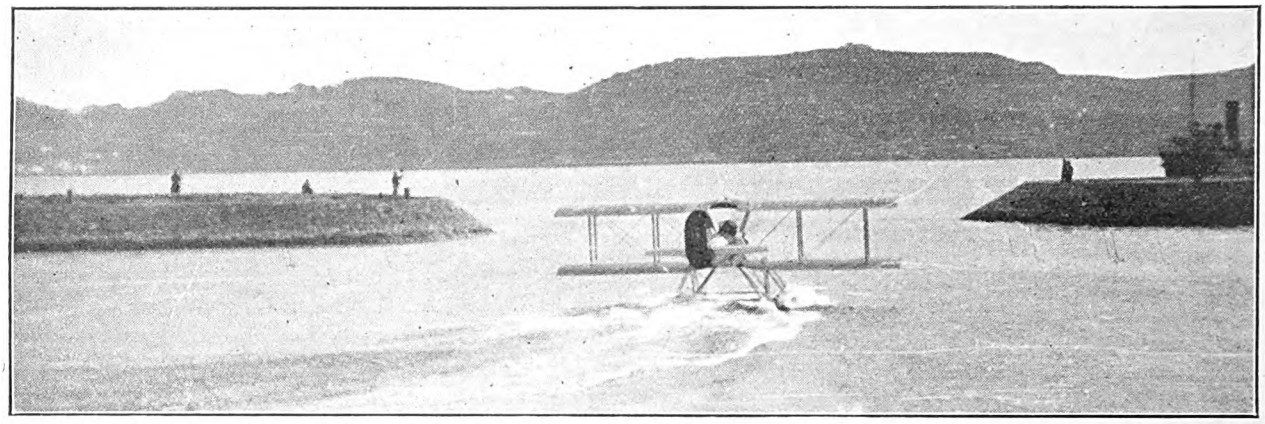


AFTER MANY YEARS.—A Portuguese training seaplane putting out from Bom Sucesso, whence started Vasco da Gama in the Sixteenth Century and Cabral and Coutinho in 1923.

Company, and the Blue Star, and the Furness-Withy and the Houlder lines, and any others which carry South American mail, they, with their existing connection with the Post Office, could certainly get the necessary mail contracts.

If any other firm, either a combination of aircraft firms or of high financiers such as those who are beginning to take a practical interest in aviation, were to organise such a line on their own account, they would find themselves up against the hostility of the shipping lines which already carry the mail to South America and also up against the chronic inertia of His Majesty's Post Office. Nevertheless, if some such financier had the combined pluck and patriotism to start up such a line and merely run it without regard to dead loss for a few months, the Post Office would be forced to give them the mail contracts by sheer weight of public opinion. What is wanted is somebody of the calibre of the late Sir George White, founder of the Bristol Aeroplane Co. Ltd., who used to buy up lumps of the tramway system of a great city, and then, in a manner of speaking, hold the city to ransom till the rest of the system was handed over to him. But he was a truly great man, and his like are far between.

The Physical Difficulties.

Whether such a mail line is ever put into operation or not, the time must come sooner or later when we or somebody else will run big passenger-carrying flying-boats along the route indicated in the map. The only real trouble about operating flying-boats on that line is, as already indicated, the heavy swell which always runs in the South Atlantic.

It is this constant swell which causes the surf on the West Coast of Africa, and makes anything like ordinary landing on that coast practically impossible except where there are regular harbours or estuaries of rivers. And the same swell builds up sand-bars across the mouths of rivers which otherwise would provide harbours for quite big ships.

Quite recently one had a talk with Sir Alan Cobham on this particular subject. During his voyage up the West Coast of Africa in his Short Singapore Sir Alan made a particular study of the possibilities of that coast for seaplanes. He found enough river-mouths and harbours all the way up as far as the Gold Coast to make the route possible. And North of that he found a quantity of lagoons, separated from the sea only by sand-hills, which would make adequate alighting places for the biggest seaplanes.

That is where the seaplane will ultimately have an advantage over sea-going ships for coast-lines of that kind. One of the difficulties of developing West Coast trade has been that ships can only get to the coast at infrequent places and that the bulk of the trade has to be done between ships lying a considerable distance out at sea and villages behind the sand-hills by means of surf-boats, which are frequently upset in spite of the skill of the native boatmen. With flying boats operating from lagoons communication up and down the coast can be much quicker and easier.

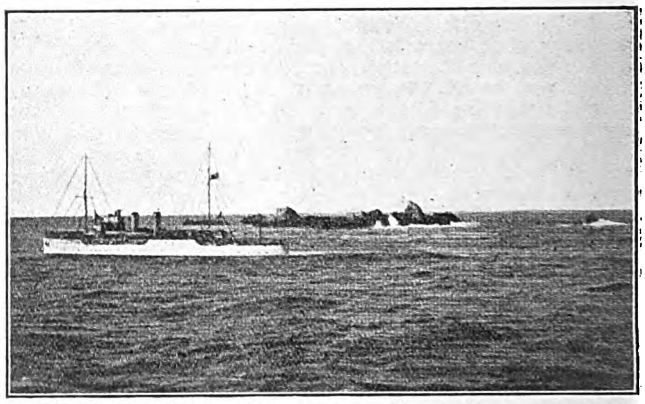
Those who wish to study this aspect of the question will do well to read Sir Alan Cobham's excellent book "Twenty Thousand Miles by Flying-Boat." He indicates therein, quite clearly, what valuable work can be done by flying-boats in the way of developing that particular coast.

While on his voyage home, Sir Alan and Lady Cobham flew out to the Canary Islands, largely with a view to investigating the possibilities of getting to those islands by flying-boats, partly because of the possibility of flying tourists or health-seekers down there in the Winter and partly with the idea of using them as a jumping-off place for trans-Atlantic air lines. And Sir Alan, like Admiral Gago Coutinho, was impressed by the extreme difficulty any existing flying-boat would find in getting off the long swell set up by the sea round and between the islands, just as it is on the coast of the Mainland.

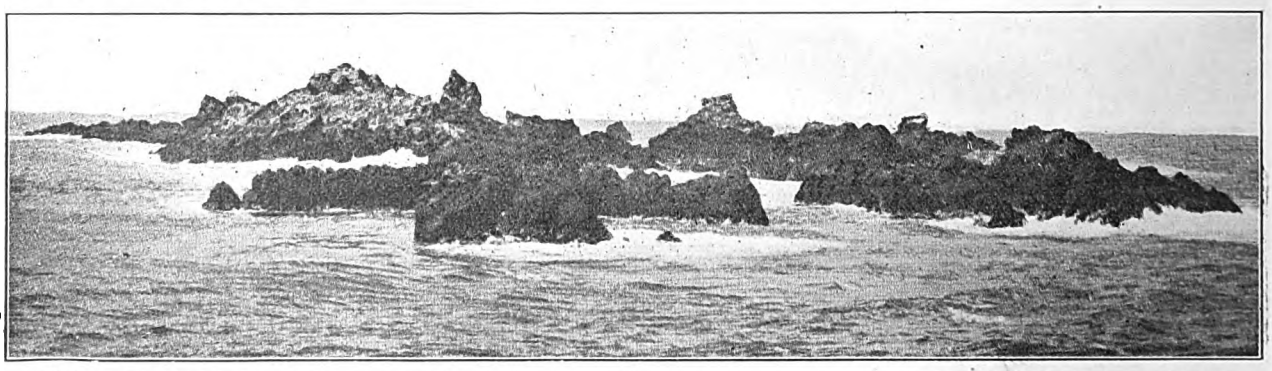
The Saving Slot.

That trouble is bound to be overcome in the course of time. Sooner or later, we shall find a way of altering the angles of wings without having to throw the whole aeroplane or flying-boat about as we do at present. And when we have produced the simple mechanism which will do this, then we shall be able to use Handley Page slots as they should be used, all along the leading edges of our wings.

Then we shall be able to haul a big flying-boat off the crest of a swell without any trouble whatever. And likewise we shall be able to drop a boat into the trough of a swell with-



SCALE EFFECT.—The Rocks, with a light cruiser in the foreground.



THE ROCKS OF ST. PETER AND ST. PAUL.—The famous half-way point in the South Atlantic on which a re-fuelling station might be built, as Sir Sefton Brancker's question to M. Grimault suggested.

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as fitted to the aircraft used on the following successful flights:—

THREE FAIREY III F (Napier) aircraft of No. 45 Squadron, R.A.F., completed a flight from Helwen, Egypt, to Nigeria and the Gold Coast and back. 8,400 miles.

FOUR FAIREY III F (Napier) aircraft of No. 14 Squadron, R.A.F., successfully completed the annual flight from Cairo to Cape Town and back—52,000 engine miles. This is the fifth successive year Fairey aircraft with NAPIER engines have carried out this flight without any mechanical trouble.

FOUR LONG DISTANCE FLIGHTS were undertaken by 205 Squadron, R.A.F., Singapore, during the S.W. Monsoon, with the object of trying out the weather possibilities for flying and the possibilities of maintaining a pre-arranged time-table between Calcutta and Singapore in adverse conditions. The machines were Supermarine-Napier Southamptons.

THE FIRST and ONLY non-stop flight from England to India was carried out with a Fairey (Napier) monoplane. 4,130 miles in 50 hours 38 mins.

THE FIRST and ONLY formation flight from England to Australia was carried out with four Supermarine-Napier Southampton flying boats. 180,800 engine miles without mechanical trouble.

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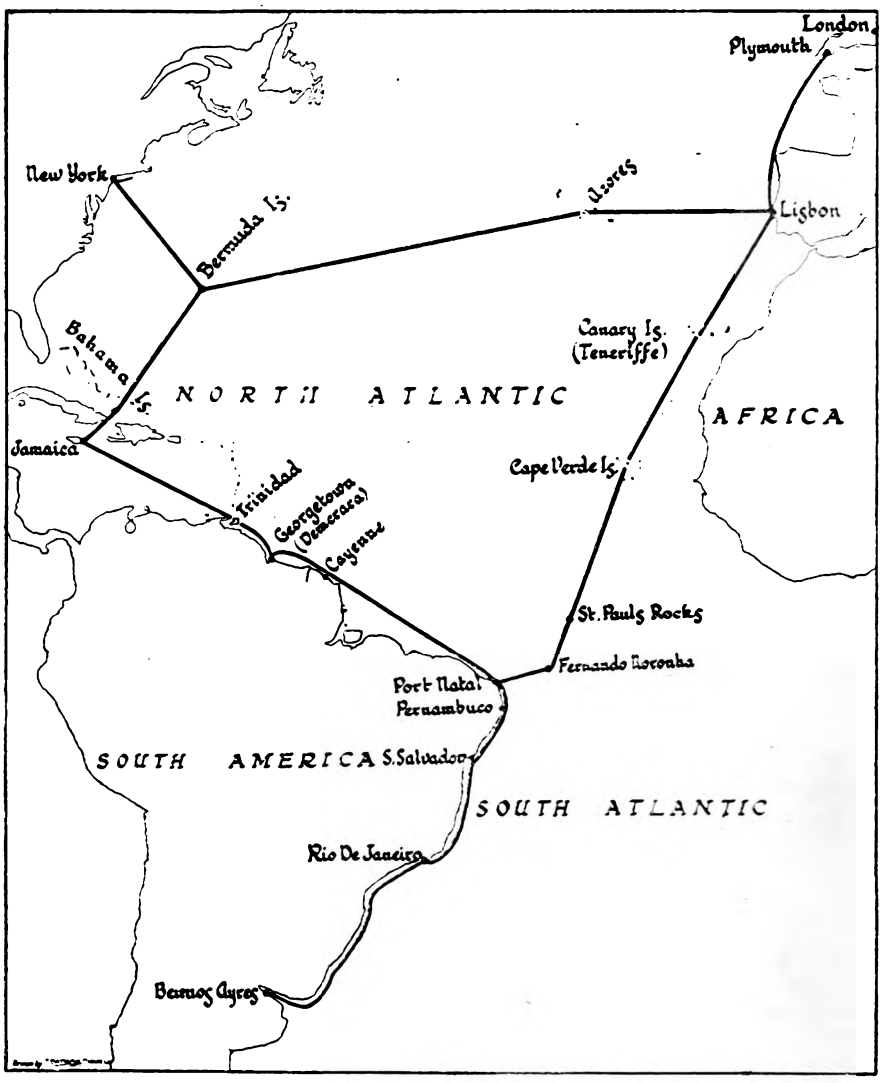
out that unpleasant experience which the late Col. W. L. Travers described, when flying off and onto the Pacific along the coast of Peru, as alighting on an aerodrome which suddenly drops away thirty feet below you just as you are touching it.

When we have developed our flying-boats to that extent there will be very little difficulty about running a passenger line to South America as well as a mail line. But in the meantime, we should seriously investigate the immediate problems of flying the South Atlantic.

The *Compagnie Aéropostale*, as Monsieur Grimault indicated in his lecture recently, intend to use flying-boats of a weight of 10 tons for an experimental service between Dakar on the West Coast of Africa and Port Natal on the coast of Brazil during the coming summer. These boats will take off the harbour at Dakar and will trust to luck and their motors to get to Brazil non-stop.

That journey has been made before now, but it is not the way to run a regular service either of high-speed mail machines or of passenger-carrying flying-boats. It entails such a long non-stop stretch that the lifting capacity of the flying-boat is entirely wasted in carrying its own petrol when it ought to be able to stop and refuel at several places and so carry a bigger load of mail or goods.

One feels that when we do ultimately establish our own air line from London to Lisbon, and from Lisbon by way of the Portuguese and Spanish Islands to South America,—with branches to West and South Africa,—we shall owe a deep debt of gratitude to Admiral Gago Coutinho for his great pioneer work as one of the two first men to cross the South Atlantic and for his special study of air navigation in general and of the navigation of the South Atlantic in particular.



What Portugal Wants.

Now let us return to the immediate needs of Aviation in Portugal. The first thing that the aviation people want is a first-class Commercial Aerodrome near Lisbon. And there is big money to be made by building that aerodrome.

One fears that Portuguese Civil Aviation is already so much in the hands of the Spela people that a French firm will get the contract. But the contract can hardly be definitely signed as yet, and one believes that if one of our great Contracting firms, such as those who cheerfully undertake a contract for a few millions of pounds to build a dam somewhere in the heart of Central Africa, or somewhere up about 10,000 feet in the Himalayas, would just turn their attention to this simple near-at-hand proposition the business could be got, and from it a great deal of other business might be developed for British capital and enterprise.

Such firms will do well to note that Portugal is one of the few nations in Europe at the present day which not only makes its Budget balance, but has a healthy balance on the right side. Last year there was a profit of more than two million pounds, and this year the balance will be bigger.

The Government happens to be a Military Dictatorship, but it is a very light-handed one. There is no oppression of anybody, there is little of the exiling and deporting of political opponents which has been the popular pastime of certain other Military Dictatorships in Europe.

Even the opponents of the Government, with the exception of the out-and-out bolsheviks, seem to be on quite friendly terms with their Military Dictators. And undoubtedly the Dictators themselves are the most amiable of men and whole-hearted patriots whose one desire is to see Portugal prosperous and peaceful.

(To be continued.)

THE COST OF R.101.

In the House of Commons on April 9, in reply to a question by Mr. Day, the Under-Secretary of State for Air said that the total expenditure on R.101 up to Mar. 31, 1930, including design, construction, power plant, experimental engines, overhead charges, shed and flight trials, running repairs, modifications and maintenance, had been approximately £603,500.

A BANQUET TO LORD AND LADY WAKEFIELD.

The Royal Aeronautical Society, the Royal Aero Club, the Air League of the British Empire, and the Society of British Aircraft Constructors, will give a banquet, followed by a dance, in honour of Lord and Lady Wakefield of Hythe at the Savoy Hotel, on Thursday, May 15, at 7.30 p.m., for 8 p.m. This is a direct inversion of the usual custom, which is for Lord Wakefield to give a banquet to all Whos who are Who in Aviation,—and a good many more besides.

Brig.-Gen. the Duke of Atholl, K.T., G.C.V.O., D.S.O., President of the Royal Aero Club, will preside.

Lord Wakefield's services to Aviation have been such that only a bare outline of them is possible here.

Nearly every Light Aeroplane Club in this country has been supported by Lord Wakefield, who has given in addition aeroplanes to clubs throughout the British Empire, in Canada, India, New Zealand, New South Wales, East Africa, and Singapore, to mention only a few.

To the Royal Air Force he has given the Wakefield Scholarships. To the Royal Aeronautical Society he has given the Wakefield Gold Medal and a substantial donation to the Society's Endowment Fund.

He has given innumerable cups and trophies for flying, large sums to the Royal Aero Club's Racing Fund and to the expenses of the Schneider Trophy Contest, and has financed many world pioneering and survey flights.

His most recent encouragement of aviation has been the gift of £1,000 to the British Gliding Association.

The Councils of the Societies hope that all Members who are able to do so will take this opportunity of honouring Lord and Lady Wakefield by being present. *Members may be accompanied by guests.*

The price of tickets (exclusive of Wines, etc., but including a running buffet till 2 a.m.) is £1 1s. *Early application to the Royal Aero Club for tickets is requested.*

This is probably the first important event in British Aviation in the last eleven years to which Sir Charles Wakefield has not been asked to subscribe.

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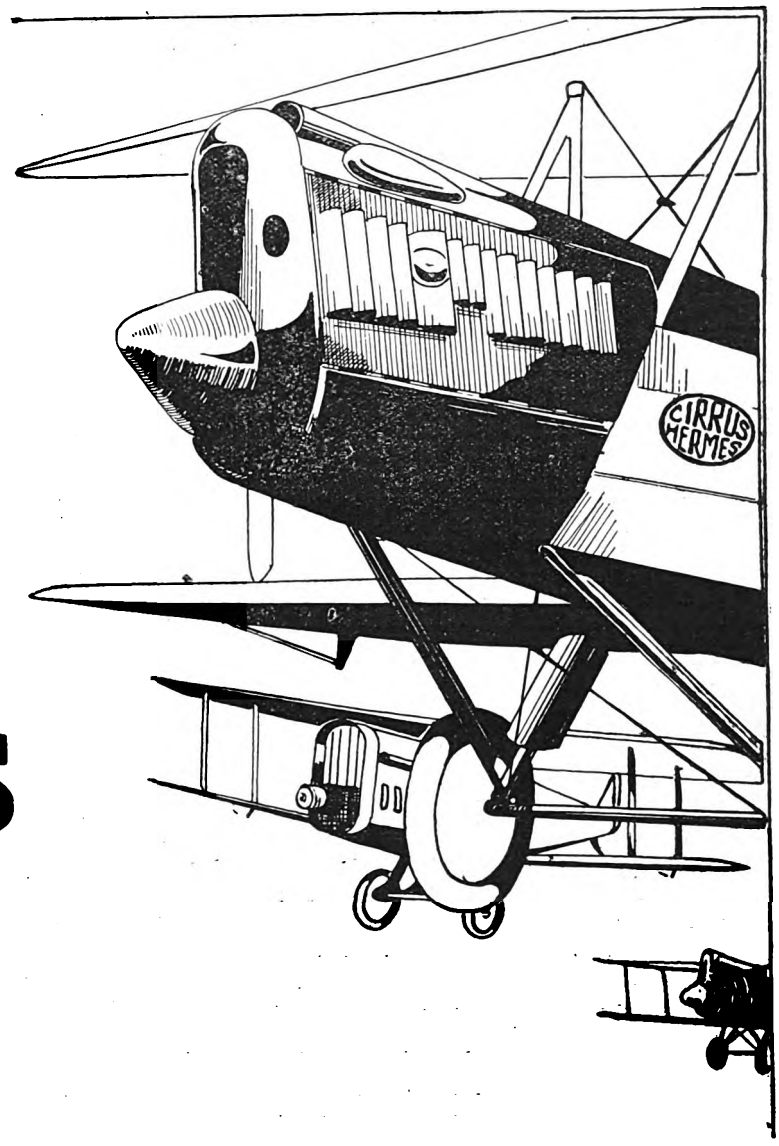
ANOTHER RACE WON BY A HERMES AVIAN!!



ON SATURDAY, 12TH APRIL, MR. S. A. THORN, FLYING A HERMES-AVIAN G-AAHJ, WON THE IMPORTANT RACE FOR THE SIR ARTHUR ATKINSON CHALLENGE TROPHY AT THE MEETING OF THE HULL AERO CLUB, OVER A COURSE OF THIRTY MILES AT AN AVERAGE SPEED OF 111 M.P.H.

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THE FASTEST ACROSS THE STATES.

On April 20 Col. Charles Lindbergh, accompanied by Mrs. Lindbergh, left Glendale, near Los Angeles, at 05.30 hours (Pacific Standard time) in a Lockheed Sirius monoplane (Pratt and Whitney Wasp engine) and flew across the United States to New York in 14 hrs. 45 mins. flying time.

From Glendale he flew to Wichita, Kansas, a distance of 1,250 miles, in a little under 7 hours. He stopped at Wichita just long enough to take in 245 gallons of petrol, and left again 20 mins. later.

From Wichita to New York he flew through bad weather which had been predicted by the U.S. Weather Bureau before leaving Wichita, and was compelled to deviate as much as 100 miles from the direct route to avoid the worst patches.

Between Cleveland and Pittsburgh he followed the beacons of the regular airway.

He landed at Roosevelt Field, New York, at 23.11 hrs. (Eastern Standard time) where a crowd, estimated at 10,000, gave him an enthusiastic welcome.

Most of the flight was made at a height of 14,000 ft. to examine the possibilities of regular passenger express air traffic by taking advantage of more favourable weather conditions at the higher levels.

The average speed for the coast to coast flight was 180 m.p.h.

The previous best Transcontinental Flight was made by Mr. Frank Hawks last June, when he flew from West to East non-stop across the United States in 17 hrs. 38 mins. in a Lockheed Air Express monoplane (Pratt and Whitney Hornet engine).

The New York Correspondent of *The Times* sends a statement which is typical and worthy of Charles Lindbergh. It reads as follows:—

Colonel Lindbergh said that it had been a purely experimental flight, and although highly satisfactory, did not by itself definitely establish the superiority of the higher altitudes for regular routes. That, he said, would have to be tested by further experiments which he proposed to undertake. He deprecated comparison of his flying time with that of Captain Hawks last year on the ground that he might have taken longer if he had had to fly without a stop, as Captain Hawks had done.

All the same, as the firm's slogan says:—"It takes a Lockheed to beat a Lockheed."

THE DUCHESS OF BEDFORD.

Her Grace the Duchess of Bedford, as reported in The Aeroplane for Apr. 16, left Lympne on Apr. 10 with Mr. C. D. Barnard and Mr. Robert Little, in her own Fokker F.VII *The Spider* (Bristol Jupiter geared engine), to fly to the Cape and back in 19 days.

The Spider left Assiut, Egypt, on Apr. 14, and reached Khartum in 8½ hours. On Apr. 15, the party arrived at Juba and left the following day for Dodoma, which is some 200 miles to the east of Tabora,—which latter spot would have been the next halt after Juba, but for the fact that rains had made the aerodrome unusable.

On April 17 Her Grace, together with her crew, landed at Broken Hill, Northern Rhodesia, whither they had flown from Dodoma. On Apr. 18 they landed at Bulawayo, whence they flew, on Apr. 19, to Cape Town, where they arrived in the afternoon.

The first part of the journey had thus been done to schedule, in spite of the fact that heavy rains made a change of ruote necessary.

On Apr. 21 Her Grace and her indefatigable crew left Maitland Aerodrome for the return journey at 06.17 hrs. and reached Palapye Road, Bechuanaland.

The return journey is to follow the outward route as far as Assiut, Egypt, whence *The Spider* is to fly home by way of Aleppo and Sofia.

FRENCH SUBSIDIES FOR JOY-RIDERS.

According to the Paris correspondent of *The Times*, the French Air Ministry has published the conditions of a State subsidy to private owners of light aeroplanes for 1930. The State will contribute to the cost of purchase and of upkeep of light aeroplanes used purely for private purposes under conditions which are intended to encourage the use of two-seater or three-seater machines of practical design.

There will be a fixed contribution of 8,000 frs. (£64) to the purchasing cost of all types, and further contributions of 10,000 frs. for the first passenger and 12,000 frs. for the second and third, assuming a touring endurance of 300 kilometres (186 miles), or 150 kilometres for seaplanes and amphibians, with an allowance for luggage.

There will be allowances for engine power at the rate of 100 frs. per unit of horse power up to 60 horse power, and 200 frs. per unit from 60 to 100 horse power. Engines under 40 and over 100 horse power will not be subsidised.

Allowances up to 7,000 frs. will be made for safety devices, such as parachutes and improved undercarriages, and there will be maintenance allowances of from 65 frs. to 160 frs. per hour of flying from 100 to 250 hours.

An additional maximum subsidy of 6,000 frs. will be given for metal construction.

Under these conditions the purchaser of a two-seater aeroplane of 100 horse power, of adequate range and carrying capacity, constructed of metal, and with reasonable safety devices, will have about £400, or half the average cost price, defrayed by the State.

[Precisely what the French Government expects to get out of this blatant extravagance is hard to see,—unless the subsidy is confined to pilots who are first of all certified as being fit for military service. The only advantage seems to be that work will be provided for aircraft factories which are not capable of earning their livings on their own merits in the World's markets. As the price of a first-class aeroplane is now down to £600 the French Government will be paying more than the amount paid by the private owner.—There is not even the excusable idea of subsidising commercial firms, other than air lines, to use aeroplanes for business purposes. And, this is where the scheme interests us, the money paid will be money which is still owing to Great Britain as unpaid War Debts.—C. G. G.]

MR. BUTLER'S FLIGHT TO CAPE TOWN.

On Mar. 20, as already recorded in The Aeroplane, Mr. A. S. Butler, Chairman of the Aircraft Operating Company Limited, accompanied by Mrs. Butler and Mr. Millyard (engineer), left Heston Air-Park in the Gloster AS3 (two Jupiter engines). This had been designed and built by the Gloster Aircraft Ltd. to the specification of the Aircraft Operating Company Ltd. for use in Air Survey work.

Cologne was reached after 2½ hours' flying, and on the following day they proceeded to Vienna. After stops at Belgrade and Salonika, Athens was reached on the 23rd. They had two days' rest at Athens, and on Mar. 25 a direct flight across the Mediterranean was made to Sollum.

Shortly after leaving Sollum an oil-tank sprung a leak, but Mr. Butler was able to make a satisfactory landing, and the spare oil-tank which he was carrying was fitted, and on the 27th he arrived at Aboukir. As he felt that the aluminium oil-tanks might give trouble at a more inaccessible place, he decided to have special oil tanks made of steel. This job was done with the valuable help of the Royal Air Force at Aboukir in the remarkably short time of three days. These steel tanks were fitted on Mar. 30, and Khartum was reached on the 31st.

The party left Khartum on April 1 and reached Mongalla

THE SPIDER.—The Fokker Monoplane (Jupiter geared engine) in which The Duchess of Bedford, Mr. C. D. Barnard and Mr. R. Little are flying from the Cape.

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on the 2nd At Juba tyre trouble was met, but Mr. Butler was able to leave on the 5th and reach Kisumu.

He arrived at Tabora on April 6, where a short delay of one day occurred owing to the wet state of the aerodrome. He was, however, able to get away from Tabora on the 7th, and arrived at Broken Hill on the same day.

Broken Hill is the main base of the Aircraft Operating Co.'s expedition in connection with the survey of 63,000 square miles, which is being done for the Government of Northern Rhodesia. Mr. Butler spent a little time inspecting the organisation there, and then proceeded to Bulawayo, which he reached on April 11.

Bulawayo has been the base of the Aircraft Operating Co. Ltd. for several years, in connection with the very considerable amount of survey work that has been done in that area.

On leaving Bulawayo on April 12 the party was joined by Major Cochran-Patrick. After two days' stop at Pretoria they proceeded to Cape Town, which they reached on April 15.

The 8,000 miles was covered in 74 hours' flying, which gives an average flying speed of 108 miles per hour. The highest credit is due to Mr. and Mrs. Butler for a very fine performance. They reached Cape Town in 25 days, and the flight was merely a normal business journey with the maximum precautions for safety. The flight is notable for the fact that no serious incidents were encountered, thus proving the increasing value and safety of aerial transport. This performance is even more impressive when one realises that the aeroplane is not merely a new type, but is the first of its type, and had only done relatively short tests in this country. The pilot had therefore had only a limited amount of experience on the machine before setting forth on his long journey over two continents.

THE COMTE HENRI DE LA VAULX.

On April 18 the Comte Henri de la Vaulx was killed near Jersey City, N.Y., when an aeroplane belonging to Canadian Colonial Airways, in which he was travelling between Albany and New York, flew into a high-power cable and caught fire.

Over Jersey City the aeroplane flew into dense fog and the pilot came down very low over the city to try to find a suitable landing-place. He eventually found a hole in the fog over the meadows alongside the Hackensack River. These meadows are covered with a network of high-tension cables from the city's electric supply works. The machine hit one of these cables and crashed, killing the pilot and the three passengers.

The Comte Henri de la Vaulx was a pioneer of aviation in France, and was President of the *Fédération Aéronautique Internationale.*

He was born in 1870 and first distinguished himself as an explorer in South America. He was one of the founders of the *Aéro Club de France* in 1896 and in 1900 he won the first prize at the Paris Exhibition for aeronautics by a flight in a balloon from Paris to Kieff. He was one of the earliest pilots of airships in France and was later a pioneer of heavier-than-air craft.

The Comte Henri de la Vaulx was the apostle of flying in France. His custom of late has been to make long propagandist flights every year, and there is little doubt that he holds the record for long-distance flying by a private passenger. His flights have always been over established routes where possible, and only on special journeys when there have been no regular air lines has he used special machines. In every flight he has used aircraft belonging to the country over which he has flown.

His tours have embraced Europe, Africa and North and South America. His enterprise for a man of his age and importance has done a vast amount for the good of aviation all over the World.

His death is deeply deplored by all concerned with aviation. To France, to his relatives, and to his many friends and collaborators all over the World THE AEROPLANE extends its sincere sympathies.—L. B.

IMPORTANT DATES.

April 26.—No. 45 Squadron Re-Union Dinner.
May 2.—Annual A.I.D. Dinner.
May 5.—R.A.F. Staff College, Second Term begins.
May 7.—Air League Ball.
May 9.—De Havilland Technical School Dance.
May 10.—Athletics. Triangular Tournament: R.A.F.C., R.M.C., and R.M.A. at Woolwich.
May 10.—N.F.S. Meeting at Leeds.
May 15.—Dinner to Lord Wakefield by the R.Ae.S., the R.Ae.C., the S.B.A.C., and the Air League.
May 17.—Brooklands Flying Display and opening of Brooklands Aero Club.
May 29—June 14.—Royal Tournament at Olympia.
May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support).
June 7.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—R.A.F. Garden Party at Manston.
June 15.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gwynn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
July 3.—Indian Empire Garden Party at Hurlingham.
July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).
July 13.—N.F.S. Meeting at Leeds.
July 19.—N.F.S. Meeting at Hull.
July 20—Aug. 7.—International Touring Competition.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

THE AIR YACHT.—Mr. and Mrs. Norman Holden and friends with their Saunders-Roe Cutty Sark amphibian (Cirrus-Hermes engines).—(*"Aeroplane" photograph.*)

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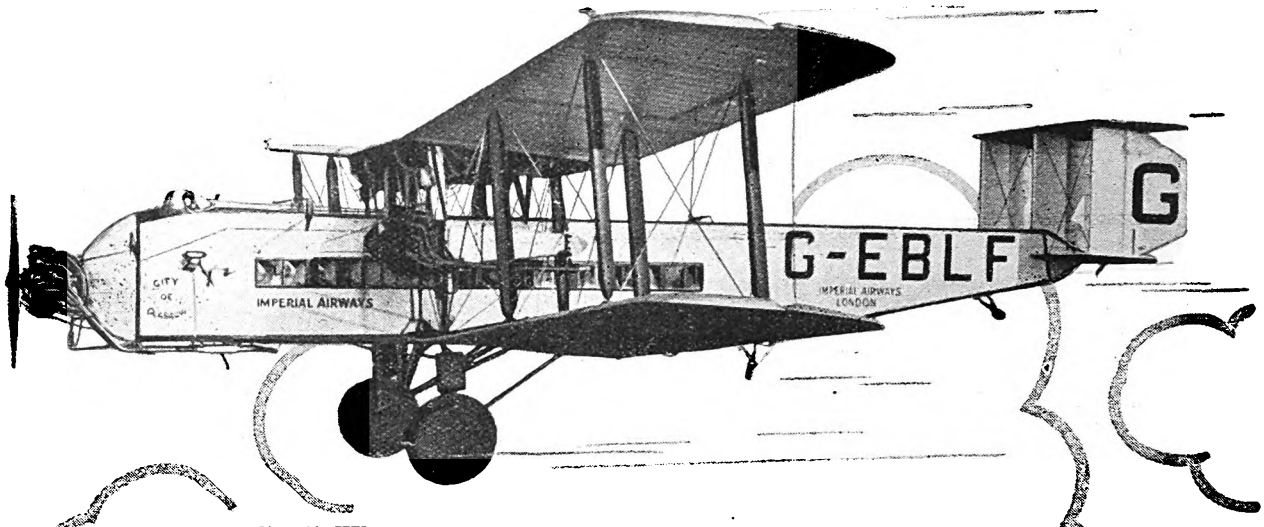

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The Prime Minister.

The Prime Minister, Mr. Ramsay MacDonald, flew from Hendon to Lossiemouth in a Service Fairey III.F of No. 24 (Communication) Squadron, on Apr. 16. The pilot was Flt. Lt. H. W. Heslop, R.A.F. The journey, which was made in bad weather, took about 6½ hours.

The Anglo-Egyptian Treaty.

The possibility of establishing a British Service aerodrome at Port Fuad on the eastern bank of the Suez Canal, opposite Port Said, was one of the questions raised at the Anglo-Egyptian Conference at the Foreign Office on April 16.

The Times report of the proceedings states:—

It was taken for granted until recently that the British troops would be quartered, after the provision of the necessary barracks, aerodromes, water-supply, gardens and other amenities, near Ismailia, and elsewhere in a zone of from 10 to 12 miles in depth to the west of the Canal, including large tracts of hard desert which are suitable for military training.

It seems that the Egyptian delegates desired that the garrison should be concentrated on the Eastern or Asiatic side of the Canal, where deep, soft sand and dunes are widely distributed; a region generally unsuitable for training and detested by the troops who had to plough through it in the War.

Port Fuad, opposite Port Said, a suitable base for aircraft, but most unsuitable for the training of ground troops, is said to have been the station first proposed by the Egyptian negotiators, after which they suggested Kantara, where a large, uncomfortable, and none too healthy base camp was set up during the Palestine campaign. Soldiers who spent any time in that cheerless and dusty sandpit will be relieved to know that it will not be the future station of the British garrison.

There is reason to believe that the basis of an agreement on the location of the British troops in the Canal zone have now been reached, and that if a treaty is signed it will be found that they will be quartered mainly in the stretches of firm desert west of Ismailia, where the great camp of Moascar was formed during the War.

International Comparisons of Air Forces.

In the House of Commons on April 15 Sir Samuel Hoare asked the Under-Secretary of State for Air whether he would give the figures in percentages of increase or reduction of the Air Estimates for the last five years in the United States of America, France, and Italy; the strengths in first line machines for each of these years and the corresponding British figure; and any increase in the number of units projected by these countries in the Estimates of this year?

Mr. Montague gave the following table showing the approximate percentages of increase or reduction in air expenditure for the year 1930 as compared with the year 1925 in the case of Great Britain, the United States of America, France and Italy:—Gt. Britain —2; U.S.A. + 140; France + 114; Italy + 31.

Owing to differences in statistical methods and other factors, such as the fluctuations in strength which occurred from time to time, it was difficult to supply strictly comparable figures for the numbers of first-line machines maintained by this country and the other countries specified in the question for each of the last five years.

The following table, however, gave the approximate figures, based on the latest official and other information available in the years 1925 and 1930 respectively (the first figure in each case is first-line strength in 1925, and the second figure is first-line strength in 1930):—

Great Britain, 630: 780; France, 1,280: 1,310; U.S.A., 750: 950; Italy, 600: 1,100. The figure of 1,100 for the Italian Air Force is understood to be a temporary excess over normal establishment which is in the neighbourhood of 1,000.

The following new regular squadrons or equivalent units were likely to be formed during the current year. (The first figure in each case indicates the number of squadrons due to form in 1930, and the second figure is the corresponding number of first-line machines.)

Great Britain, 2: 16; U.S.A., 4: 24; France 4½: 48; Italy, no information available.

In addition one non-regular squadron of 12 machines was to be formed in this country during 1930.

The Naval Conference and Aircraft Carriers.

The following reference to aircraft carriers is contained in the *Memorandum on the Results of the London Naval Conference from January 21 to April 15, 1930* (Command Paper 3547):—

As regards aircraft carriers, His Majesty's Government have not been able to obtain at this Conference a modification of the total tonnage and displacement limits laid down in the Washington Treaty. It was agreed that this matter should be left over until a conference in 1935, but meanwhile His Majesty's Government's proposal that aircraft carriers under 10,000 tons should be included in the aircraft carrier category has been generally agreed to, and the further provision has been added that the gun armament for these particular vessels should not exceed 6 inches in calibre, instead of 8 inches.

The Administration of the Fighting Services.

In the House of Commons on April 9 Commander Bellairs asked the Prime Minister whether, in the interests of economy and efficiency, the question of placing the Admiralty, War Office and Air Ministry under a Minister of Defence had been considered, and whether he was in a position to make any announcement as to this proposal. Mr. Henderson said that the answer was in the negative.

Air Power.

A particularly logical and interesting contribution to the problem of the function of the Air Weapon in peace and war appeared in an article by Major-General Sir Frederick Maurice, in *The Times* of Apr. 16.

Major-General Sir Frederick Maurice is a distinguished soldier and War Historian and his article should be read by all those who are interested in this important subject. At the same time, certain of his arguments seem to be based on insufficient knowledge of modern aircraft, and may be discussed in this paper at a later date.

COMING IN TO DECK.—A Fairey III.F (Napier Lion engine) about to alight on the deck of H.M.S. "Furious." The personnel in the foreground are preparing to seize the machine as soon as it has touched the deck. The attendant destroyers which always accompany aircraft carriers during flying operations may be seen in the background.

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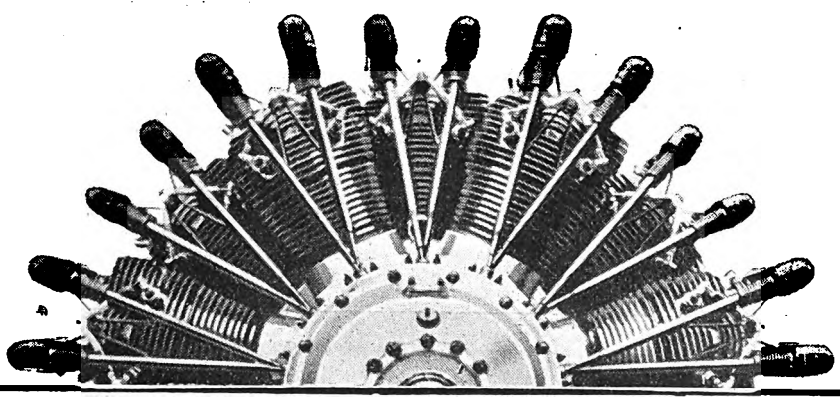
is shown by the following list of countries where they are in use:



AUSTRALIA uses Genet, Genet Major, Mongoose, Lynx, Jaguar.
NEW ZEALAND uses Jaguar.
CANADA uses Genet, Genet Major, Lynx, Mongoose, Jaguar.
SOUTH AFRICA uses Genet, Genet Major, Lynx, Jaguar.
INDIA uses Jaguar, Genet Major.
IRELAND uses Genet.
EGYPT uses Jaguar, Genet Major.
FRANCE uses Genet, Genet Major, Lynx.
GERMANY uses Genet, Lynx, Jaguar.
BELGIUM uses Lynx.
SPAIN uses Lynx.
HOLLAND uses Mongoose, Lynx, Jaguar.
SWEDEN uses Mongoose, Lynx, Jaguar, Leopard.
AMERICA uses Genet, Genet Major, Jaguar.
ARGENTINE uses Mongoose.
BRAZIL uses Lynx.
CHILE uses Lynx.
ESTHONIA uses Genet Major, Lynx.
LATVIA uses Lynx, Jaguar.
JAPAN uses Mongoose, Lynx, Jaguar, Leopard.
DUTCH EAST INDIES uses Lynx.
IRAQ uses Jaguar.
MALTA uses Jaguar.
DENMARK uses Lynx, Jaguar.
ITALY uses Lynx.
RUSSIA uses Jaguar.
POLAND uses Genet.
GREECE uses Lynx, Jaguar.
SWITZERLAND uses Lynx.
ROUMANIA uses Jaguar.
SIAM uses Lynx.
SINGAPORE uses Genet Major.

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The Royal Tournament.

The Royal Tournament, in aid of Service charities, will be held at Olympia from May 29 to June 14 inclusive. The programme will include a display of Physical Training by recruits from the R.A.F. Depot, Uxbridge.

The R.A.F. and the Persian Gulf

The following letter from Air Commodore C. R. Samson, C.M.G., D.S.O., A.F.C., R.A.F. (retired) appeared in *The Times* of April 15. There are few men whose opinions on such matters are so well worth having:—

Sir,—Admiral of the Fleet Lord Beatty in his speech in the House of Lords yesterday made one or two statements which are not correct. I spent a great deal of two commissions in the Persian Gulf, and during one of them was employed boat cruising in a 26 ft. sailing pinnace in the suppression of gun-running. Most of my time was during the worst part of the year, when *Shamâls* are frequent. From my experience in this little boat and my years spent in flying his statement that flying-boats could only operate in three months of the year is entirely fallacious.

As regards stopping and searching dhows, the limitations of a sloop are immense, taking into consideration that the majority of gun-running dhows make the passage by night. The places to catch the dhows are—(*a*) While lying in wait on the Arabian Coast awaiting a favourable wind; (*b*) while closing the Baluchi Coast at daybreak. A flying-boat can search miles of coast within a space of a few hours, while the sloop can deal with only a small section. Flying-boats can alight near a dhow and search the dhow by aid of their boat, which can easily be carried by the large flying-boats that would be used.

As regards the Red Sea, frequent conversations with captains of Red Sea sloops in 1926 and 1927 showed their keen appreciation of the uses of flying-boats for the work in this area.

(Signed) C. R. Samson, Air Commodore (Retired).

The Red House, Cholderton, near Salisbury, Apr. 10.

The Schneider Trophy Machines.

In the House of Commons on Apr. 16, in reply to a question by Mr. Day, the Under-Secretary of State for Air said that the cost of designing, building, and maintaining the Supermarine S.6 and the Gloster seaplanes which had been built for the Schneider Trophy, with their engines, had been approximately £230,000 to date. He wished to point out that they were built not only for the Schneider Trophy Contest, but also as part of the equipment of the Marine Aircraft Experimental Establishment which was engaged on a programme of research which included experimental high-speed flying. No such flying had been done recently with these aircraft because they had been undergoing reconditioning since the race, but it would begin as soon as the weather conditions permitted.

The names of the pilots of the establishment appeared in the Air Force List.

Flying Training in the R.A.F.

In the House of Commons on April 9, in reply to a question by Mr. Mander, the Under-Secretary of State for Air said that the flying training schools now in existence in the R.A.F. were at Netheravon, Digby, Grantham, Sealand, and Abu Sueir (Egypt). Persons of civilian status were not trained at those schools. The number of short service officers who had qualified according to R.A.F. standards in 1929 had been 16, 35, 29, 54 and 35 respectively. The standards to which pupils were trained at these schools was a much higher one than that required for the "A" licence, and any figures that he might give as to the approximate cost per flying hour of such training up to the "A" licence standard would be hypothetical and of small value. [On the other hand, judging by the figures given, the money which a trained pilot costs seems to be of immensely high value. Even admitting that the standard of training is high, the small numbers trained are amazing.—C. G. G.]

The Worthy Down Accident.

An inquest was held at Worthy Down on Apr. 16 on the bodies of Flg. Off. E. R. White and Plt. Off. J. Pratt, who were killed in an accident to a Vickers Virginia on Mar. 24

Wing Cdr. Norton said that this was the first serious accident No. 58 (Bomber) Squadron had suffered, although the Squadron had done 2,200 hours' night flying during the last four years. A witness said that apparently the pilot made such a good landing that he did not know he was on the ground.

A Japanese Caterpillar.

Lieutenant Kobeyashi, a Japanese officer, attached to the R.A.F. Station, Hornchurch, escaped by parachute when fire broke out in his machine over the aerodrome at Hornchurch.

Lieutenant Kobeyashi was slightly injured by being dragged a short distance by the high wind before he could release himself from his parachute.

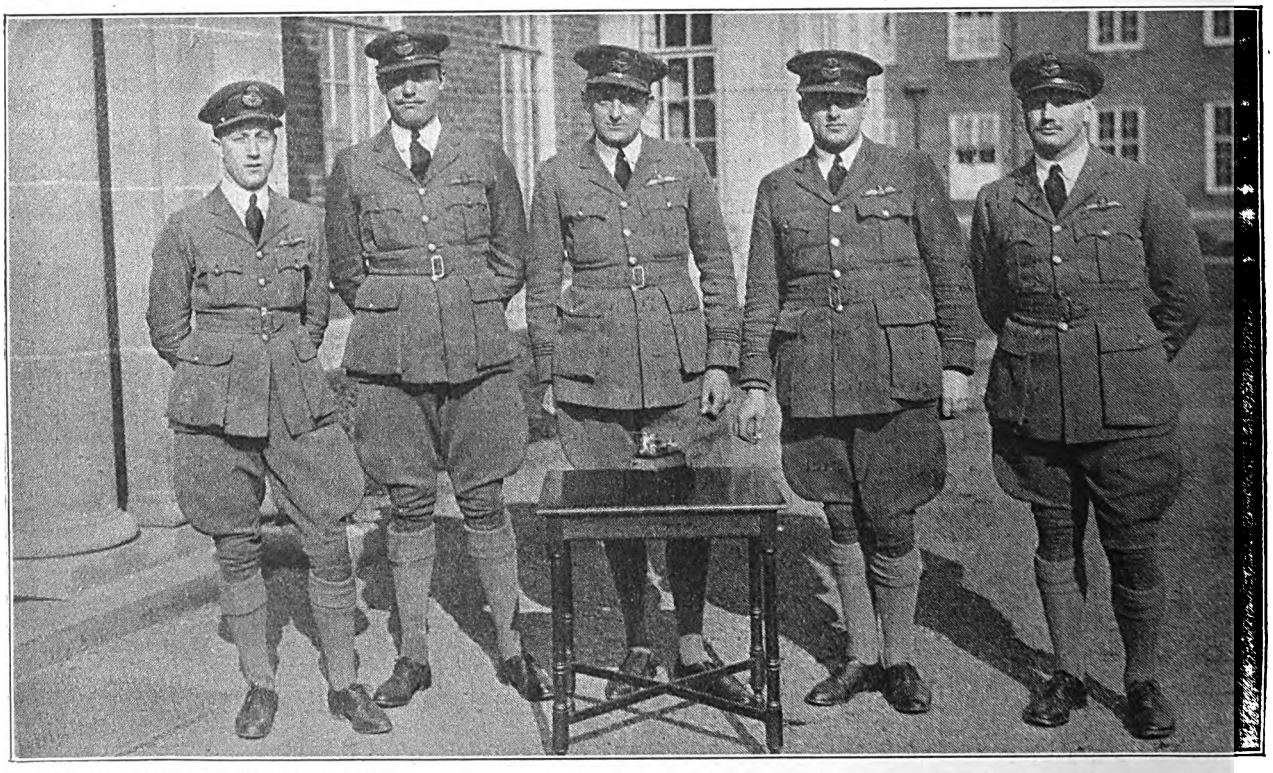
Lightning Precautions with Towed Targets.

The attention of Service pilots is drawn, in an Air Ministry Order, to the technical regulations relating to the precautions to prevent damage to aircraft by lightning when towing targets.

These regulations read:—

"1. *Bonding of target towing apparatus.*—All metal parts of target towing apparatus used for anti-aircraft and machine-gun practice must be properly bonded to the earth system of the aeroplane.

2. *Towed target practice during thundery weather.*—No hard and



THE CLARKSON TROPHY.—The competitors in the Aerobatics Competition for the Clarkson Trophy which was held at the Central Flying School, Wittering on April 16 in a strong wind. The competition is between teams of two, representing Flights, in Avro Lynx Training machines. From left to right: Plt. Off R. W. Letchworth, Plt. Off. D. P. Lascelles, Flt. Lt. E. C. Barlow, Flg. Off. B. W. Knox, Flg. Off. J. E. Markby. Sq. Ldr. Jones of the Royal Australian Air Force, who was also a competitor, is not in the group. The competition, which was judged by Mr. C. Clarkson, R.A.F.O., the giver of the Trophy, was won by 'B' Flight, Flg. Off. Markby and Plt. Off. Lascelles.

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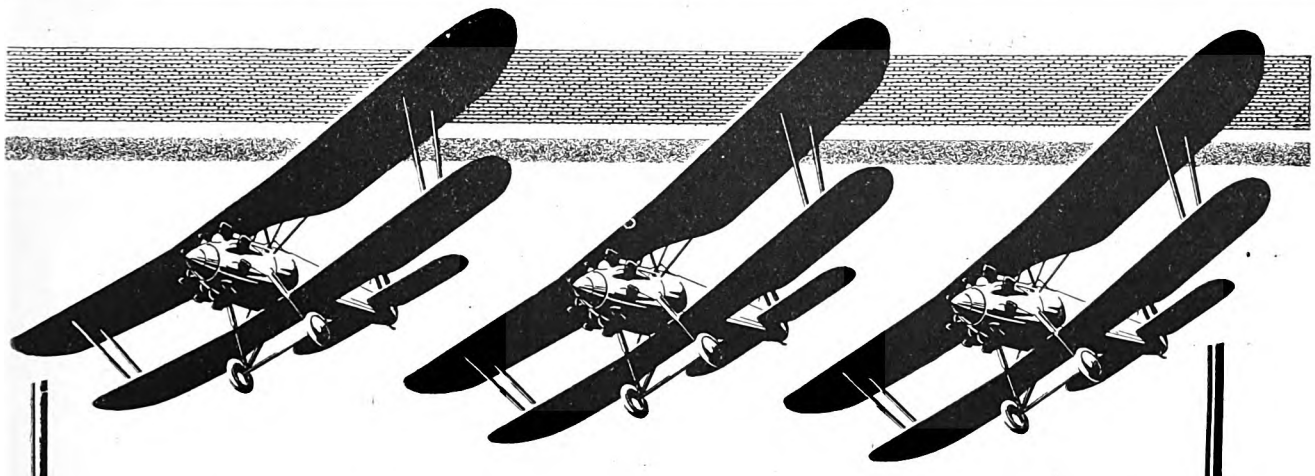

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fast rule can be given as to when conditions become dangerous; the following, however, classifies the atmospheric conditions in order of their danger:—(a) Clear sky. No danger whatever. (b) More or less cloud, but no precipitation; danger so remote that it can be neglected. (c) Steady light rain. Very little danger. (d) Showery rain, especially from detached clouds. The danger is sufficiently great to make it advisable not to tow targets. (e) Heavy showery rain, hail or snow (light or heavy). The danger is very real and targets should not be towed. (f) Visible electrical discharges, far or near. The danger is great and increases with nearness of the discharges. To tow a target in these conditions is definitely dangerous.

3. Target towing should be carried out only if the weather conditions are as given under (a), (b) or (c) above."

[Pilots are recommended to carry either a piece of seaweed or a post-card donkey with a woollen tail.—Ed.]

The R.A.F. Staff College.

Full details of the regulations for the entry of Students to the R.A.F. Staff College are contained in an Air Ministry Order published for official use on April 10.

To become eligible for selection by the Air Council, officers are required to pass the qualifying examination and to fulfil certain conditions. The conditions are:—

(a) Holds a permanent commission in either the general duties branch or the stores branch.

(b) Is not above the age of 35 on Apr. 1 in the year of the examination.

(c) Is not below the rank of Flight Lieutenant nor above that of Wing Commander.

(d) Has qualified as a pilot (general duties branch only).

(e) Is recommended by his C.O. and A.O.C. as suitable for employment on the staff.

(f) Is approved by the Air Council.

Examination papers are set with the object of ensuring that candidates for the Staff College have attained a certain standard of knowledge and that they are capable of:—

(i) Writing a brief series of logical arguments discussing any of the principles of war laid down in the R.A.F. War Manual, Part I (Operations), or any subject of current interest affecting the application of those principles.

(ii) Discussing how those principles were applied in war by commanders in the past and considering how modern inventions will modify the application of them in the future.

(iii) Applying the principles of the R.A.F. War Manual, Part I (Operations), in the solution, on a map, of problems on the employment of air forces. A knowledge of the general organisation, armament, characteristics and employment of each arm of the three services, and the principles governing the combined action of all arms, is required. Candidates must be able to write a sound appreciation of the situation and to produce clear orders.

(iv) Expressing their ideas in clear and concise terms and arranging their composition in a coherent and logical manner.

The Equipment of the R.A.F. College.

In the House of Commons on Apr. 16, in reply to a question by Capt. Balfour, the Under-Secretary of State for Air said that D.H.9a biplanes were still used for training cadets at the R.A.F. College, Cranwell. This type would be replaced by Atlases, the standard type of Army Co-operation machines, during the Summer of this year.

Night Flying Without Navigation Lights.

Service aircraft will be flying without navigation lights between 19.00 hours and 23.59 hours on the dates and under the circumstances stated below. They will not extinguish their navigation lights below a height of 5,000 when flying over the area used by the civil routes to the Continent. Aircraft flying without navigation lights will switch on their lights on the approach of other aircraft:—

(i) Within straight lines connecting Reading—Stowmarket—Cranbrook—Alton—Kingsclere—Reading. Apr. 14 to Aug. 31. 3,000 ft., except where area covers civil air routes, where the height will be 5,000 ft.

(ii) East of straight lines connecting Dungeness—Lympne—Dover. June 2 to July 12. 5,000 ft.

(iii) Within straight lines connecting Minehead—Start Point—Watchett—Minehead. June 8 to Sept. 7. 3,000 ft.

(iv) East of straight lines connecting Herne Bay—Canterbury—Deal. June 22 to Aug. 17. 3,000 ft.

(v) East of straight lines connecting Aldeburgh—Cambridge—Dartford—Beachy Head. July 15 to July 17. 5,000 ft.

(vi) South of straight lines connecting Beachy Head—Sevenoaks—Farnborough—Netheravon—Bournemouth. July 22 to July 24. 5,000 ft.

(vii) Within straight lines connecting Newbury—Winchester—Salisbury—Devizes—Newbury. (*Note.*—Over this area flying may be continued until 01.00 hours.) July 1 to Aug. 31. 3,000 ft.

The R.A.F. Dinner Club.

The eighth annual dinner of the R.A.F. Dinner Club will be held on June 27, the eve of the R.A.F. Display.

The membership of the Club is open to all past and serving officers of the R.A.F. (including the R.F.C. and the R.N.A.S.) until such time as the membership shall reach 500, when the committee is empowered to make such limitations on future membership as it thinks fit. Officers of the Royal Navy and Army attached to the R.A.F. are eligible for ordinary membership while they are so attached.

The subscription for ordinary membership is 5s. annually, and for life membership £3 3s. Forms of application for membership may be had from Sq. Ldr. J. O. Andrews, D.S.O., M.C., Hon. Sec. R.A.F. Dinner Club, Air Ministry, Kingsway, W.C.2.

R.A.F. SPORTS.

The R.A.F. in Egypt.

The R.A.F. in Egypt finished a successful season of inter-Service sports on April 5, when they defeated the Army in a Boxing tournament at Heliopolis by nine bouts to five, and twenty-three points to nineteen.

On the same day they beat the Army at Association Football by three goals to one. In January the R.A.F. in Egypt beat the Army in Egypt at Rugby football by 21 points to 5, as was duly recorded in The Aeroplane, and since that date the R.A.F. have beaten the Army at hockey.

The results of the Boxing tournament were as follows:—

Fly-weight.—AC. Evans (R.A.F.) knocked out Pte. Davis (Army) in the second round. Davis scored at the start, but in the second round Evans unloosed a beautiful right hook to the jaw. He followed this up with heavy head and body blows and finally knocked out Davis with a terrific right to the jaw.

Bantam-weights.—Pte. Smith (Army) beat L-AC. Stockwell on points. Tpr. Briggs (Army) beat AC. Virtue (R.A.F.) on points.

Feather-weights.—AC. Iddon (R.A.F.) beat Dvr. Radford (Army) on points although the soldier had an advantage in reach. AC. Callicott (R.A.F.) beat L/Cpl. Aspinall in the second round, the Referee stopping the fight.

Light-weights.—L-AC. Dugan (R.A.F.) beat L/Cpl. Bennie (Army) on points. Dugan was too experienced for his opponent. L-AC. McAvoy (R.A.F.) beat L/Bomb. Eden on points.

Welter-weights.—L-AC. Asplin (R.A.F.) beat Pte. Gray (Army) on points in a bout which was one grand slam from beginning to end. AC. Johnson (R.A.F.) beat L/Cpl. Walker (Army) on points. There was too much holding in this match.

Middleweights.—Sjt. Wheeler (Army) beat Sjt. Cardwell (R.A.F.) on points. L/Sjt. Dow (Army) beat Cpl. Warner (R.A.F.). Warner went down in the second and third rounds but fought back well.

Light-Heavy-weights.—L-AC. Christian (R.A.F.) beat Sjt. Giles (Army) on points. Christian put up a fine show and fully earned the verdict. Pte. Clark (Army) knocked out L-AC. Berry (R.A.F.) in the second round with a right to the jaw.

Heavy-weight.—Flt. Lt. Chichester (R.A.F.) beat Lt. Saunders (Army) in the second round, the Referee stopping the fight. Saunders was obviously outclassed.

Association Football.

The R.A.F. Cup Final-replay was held at Uxbridge on April 16. Henlow won by one goal to nil after a desperate fight.

Henlow had rather the better of the exchanges. Kelly and Robinson, their Internationals, were undoubtedly in a class of their own, the latter dominating the midfield play. The defensive work of the backs on both sides was very sound, Johnson being very careful to see that Kelly was not allowed to run loose. It is, however, conceivable that the close attention paid to the latter was responsible for Martin being given the glorious opportunity which led to the fall of the Kenley citadel. The teams were the same as in the previous game. S-M. May of Northolt had charge.

The weather was fine although rain had fallen earlier in the day. Kenley attacked vigorously from the outset, and a faulty clearance by Mawdesley forced Malin to clear from Rowley. Pressure was not sustained and play was quickly transferred to the other end, where Hill hit the upright with a crashing drive. Rule was sent away clear of the backs by Hill, but the upright again frustrated the Henlow attack. Robinson narrowly missed with a header from a flag kick by Martin, and a good shot from West was safely held by Potter. At the other end Malin cleared a smart centre by Prince. After 35 minutes, Rule secured from a throw-in and sent across smartly to Martin, who dashed in and scored with a good cross shot.

In the second half Rowley gave Prince a fine opportunity, but the latter hit the side rigging, and play was again transferred. During a mêlée in front of goal one of the Kenley defenders handled in the penalty area, but the referee was unsighted and Henlow were thus robbed of a good opportunity of increasing their lead. Potter made many smart saves. Rowley appeared to have a grand opportunity of getting through when brought down by Pond just outside the penalty area, and although the referee awarded a foul, nothing materialised from the free kick.

After the match the cup and medals were presented to the Henlow team by Mrs. Graham.—C. H. H.

Rifle Shooting.

The result of the second stage of the R.A.F. Small-bore Rifle League Competition, which was held at Bisley on April 13, was as follows:—

(Teams of 8; 10 rds. delib., 10 rds. rapid; h.p.s., 1,600 pts.)

1st Round.—R.A.F. Col., 1,539, beat 32 Sqdn., 1,532; C.F.S., Wittering, bye, 10 Sqdn., 1,546, beat 13 Sqdn., 1,434; 23 Sqdn., bye; H.A.D., 1,537, beat No. 1 (Apprentices) Wing, 1,288; S.H.-Q., bye; A. and G. Schl., w.o.; Flight Cadets, bye. 2nd Round.—College, 1,549, beat C.F.S., 1,519; 10 Sqdn., 1,554, beat 23 Sqdn., 1,511; H.A.D., 1,525, beat S.H.-Q., Andover, 1,521; A. and G.S., 1,519, beat Flt. Cadets, 1,474. Semi-finals.—College, 1,563, beat 10 Sqdn., 1,554; H.A.D., 1,543, beat A.G.S., 1,527. Final.—College (L-AC. Hall, 196, Flg. Off. H. C. D. Hayter, 196; Cpl. A. Rossner, 194; AC. G. Bayliss, 193; Cpl. J. Scudder, 192; L-AC.

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C. Rose, 192; Sjt. W. J. Barrett, 191; Plt. Off. E. Coleman, 191), 1,545, beat Home Aircraft Depôt (Flt. Lt. C. W. Hill, 195; Flt. Lt. J. H. Winch, 195; L-AC. D. Holdaway, 193; Cpl. P. W. Lambell, 192; L-AC. C. Cooke, 189; AC. H. Baker, 188; Cpl. C. H. Sexton, 188; L-AC. G. Elsey, 186), 1,526.

Inter-Services Cross-Country.

The Inter-Services Cross-Country Championship was held at Portsmouth on Apr. 16.

The Army won the team championship with 37 points. The Royal Navy and Royal Marines were second with 57 points and the R.A.F. were third with 79 points. AC. Brown, R.A.F., was third. The winner, Cpl. J. A. Broadley (Army), covered the distance of just over five miles in 32 minutes 15 seconds.

TRYING AGAIN.

THE AEROPLANE for April 2 chronicled the start, the forced landing, and rescue of the Ryan monoplane in which Mr. Smith and Lieut. Shiers are attempting to fly to England. On April 20 the Ryan left Wyndham, Western Australia, for Bima, Dutch East Indies, where it arrived the same day.

McCUDDEN, V.C.

[*Flying Fury*, by James McCudden, V.C., D.S.O., M.C., M.M., with Prefatory Notes by Marshal of the Royal Air Force Lord Trenchard, and Air Chief-Marshal Sir John Salmond, and an Introduction by C. G. Grey, Editor of THE AEROPLANE. 270 pages 8½ x 5¾, eight drawings by Leonard Bridgman, and two photographs. Historical Notes. John Hamilton. Supplied by THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, E.C.4. 9s. post free.]

This book is an illustrated reprint of *Five Years in the Royal Flying Corps*, the diary of James McCudden, V.C., one of the most gallant and skilful fighting pilots of the R.F.C. The manuscript was handed to Mr. Grey for publication by its Author a few days before his death, and appeared in 1918 exactly as it was written, but with the addition of the Prefatory Notes and Introduction which appear in the new edition and some footnotes which increased the interest and value of the book to those outside the aeronautical community.

In the original version, as it was produced during the War, the names of aerodromes and the numbers of squadrons were suppressed by the Censor. These have been discovered by Mr. Leonard Bridgman and have been published in the present version, together with brief histories of each squadron concerned.

These notes have been brought up to date in the new edition, and others have been added. Another valuable addition are the eight illustrations by Leonard Bridgman. In common with the rest of this artist's work they combine technical accuracy with a vivid impression of movement and a vigorous beauty of line.

The book begins in April 1913, when the Author's application for a transfer to the R.F.C. from the Royal Engineers had just been approved. A month later he had been up for his first flight, although still under open arrest for wrecking two machines in their shed by practising propeller-swinging with the engine switched on.

The rest of Book I is a description of the life in the early days of the R.F.C. of a mechanic who was keen, intelligent, and painstaking.

On the outbreak of the War he went to France with No. 3 Squadron. He was promoted to Sergeant and served with the Squadron in France as an observer until the beginning of 1916, when he was sent home to learn to fly. He soon qualified, and by May 1916 was an assistant-instructor at the Central Flying School.

He went back to France in July and was posted to No. 20 Squadron to fly F.E.'s. He was awarded the Military Medal the following October. Shortly after this he was posted to No. 29 Squadron and flew D.H.2's. He distinguished himself as a fighting pilot while with this Squadron, and in January 1917 he was given a commission. Six weeks later he was awarded the Military Cross.

A short period of instructional work in England gave him opportunities for trying-out numbers of new and sometimes experimental machines. In June he was given the temporary rank of Captain and gazetted Flight Commander, and during the same month he went into action against enemy raiders over London.

After a refresher course in France with No. 66 Squadron he was posted to No. 56 Squadron as a Flight Commander. This Unit was then the crack Squadron of the R.F.C. and was equipped with S.E.5's. Life with No. 56 Squadron consisted of unceasing war in the air, and by Jan. 1, 1918, the Squadron had 249 enemy aircraft destroyed to its credit. McCudden had by this time the D.S.O. and a Bar to the Military Cross. On Jan. 3 he was awarded a bar to the D.S.O., and on April 2 he was awarded the Victoria Cross.

He was posted to Home Establishment in March 1918 and became a highly efficient fighting instructor, although his heart was in France. In July 1918 he was appointed to command No. 60 Squadron in France. He was killed in a flying accident on his way to join his new command.

Discerning readers of autobiography, students of military aeronautics and lovers of a brave tale of adventure well told will welcome the new edition of this book. And because of the new generation to whom it will bring an appreciation of the work of the R.F.C., the friends of James McCudden will try to forgive the Publishers for calling it *Flying Fury*.—C. M. MCA.

[Anything less fitting than the title *Flying Fury* would be difficult to discover. James McCudden was the typical professional soldier, who fought and killed because it was his job, and he did his work without malice and without any more excitement than is caused by any other fight. His cold and calculating method of fighting, as set forth by himself, should be a lesson for all young pilots in the Air Services of all Nations who are wise enough to read his story. Fury was the last emotion that he felt, as readers of this extraordinary book will realise. Such a kinematographical title is enough to fetch James back to this Earth in protest. But no doubt his sense of humour will bring forgiveness to his publishers.—C. G. G.]

A BOOK FOR STUDENTS

Elementary Laboratory Aerodynamics. By Arthur L. Jordan. Published by The Ronald Press Company, New York. Price $0.80, and obtainable from THE AEROPLANE Book Department, Cannon House, Pilgrim Street, E.C.4.

This book has been written by Mr. Arthur L. Jordan, Head of Science Department, Polytechnic High School, San Francisco, to supplement the standard text-books on Physics generally used in high-schools and technical colleges. Mr. Jordan describes 21 practical experiments in aerodynamics to be made by students in the normal physics laboratory.

Although the book is written for the American market (references are constantly made to standard types of American aircraft), yet the book is worth the attention of students who wish to make simple experiments as a first excursion into Aerodynamics, and also the teacher or lecturer who wishes to start a course in this subject.

An attractive feature of this book is the way in which it encourages the teacher or lecturer to make a start from the scantiest beginnings, that is, with but few pieces of apparatus. Mr. Jordan consistently outlines ways and means of improvising apparatus.

The book can be easily followed, as it assumes only a knowledge of Elementary Algebra and Plane Geometry. There are some references to Trigonometry, but these can be omitted.

THE DIARY OF MAJOR J. B.

McCUDDEN, V.C.

D.S.O., M.C., M.M., Croix de Guerre.

ROYAL FLYING CORPS.

WITH PREFATORY NOTES BY

MARSHAL OF THE R.A.F. LORD TRENCHARD

AND

AIR CHIEF MARSHAL SIR JOHN SALMOND

AND AN INTRODUCTION BY

C. G. GREY (Editor of "The Aeroplane").

ILLUSTRATIONS BY LEONARD BRIDGMAN.

— UP-TO-DATE HISTORICAL NOTES. —

This book was originally published under the title of FIVE YEARS IN THE ROYAL FLYING CORPS and is now re-issued under the title of FLYING FURY.

It is a real war book, written during the war by the best Fighting Pilot in the Royal Flying Corps and the Royal Air Force.

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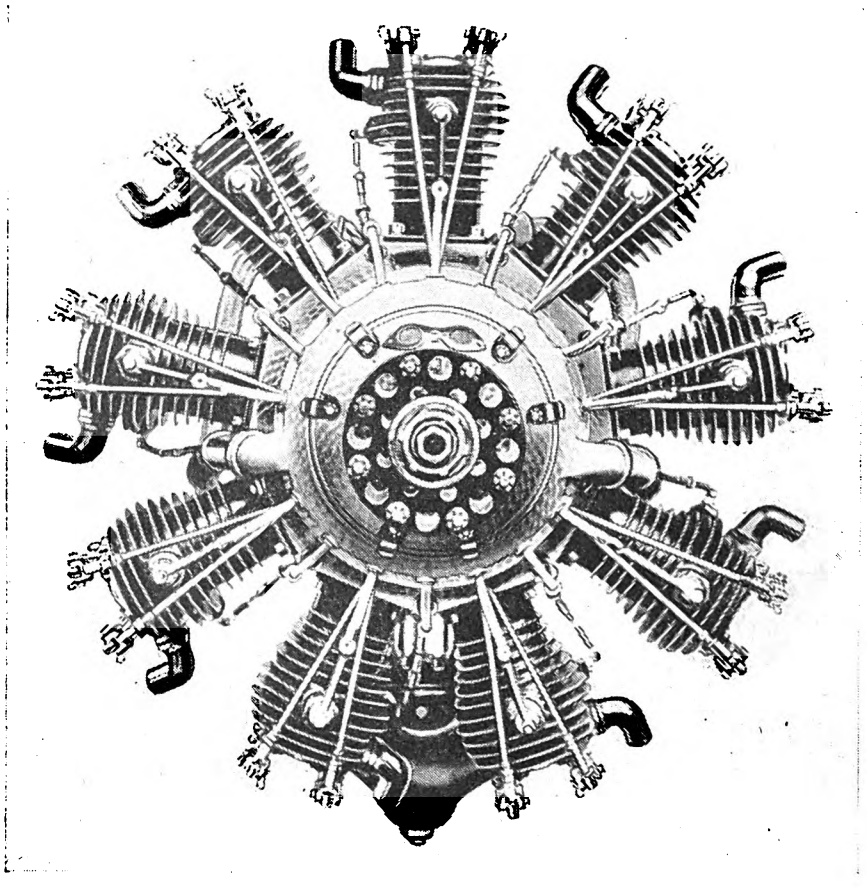

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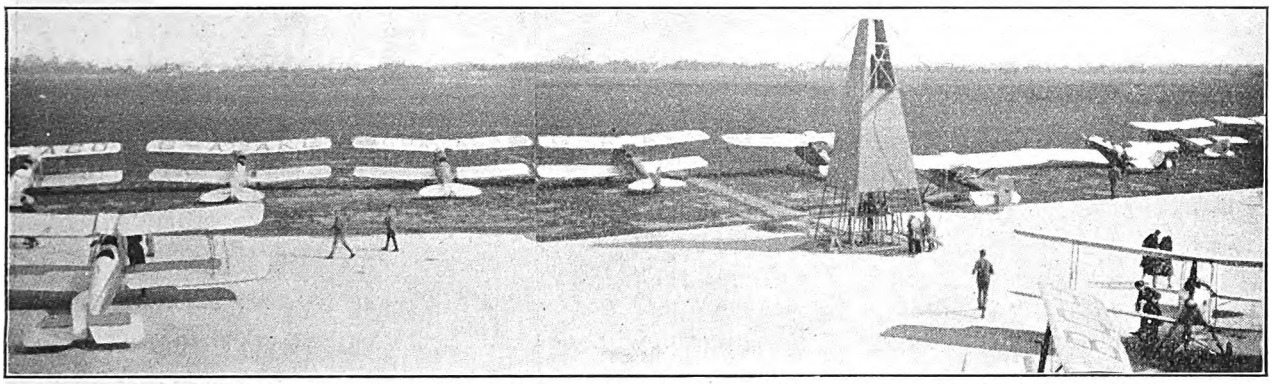
THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

AN HISTORIC OCCASION.



ALL LINED-UP.—A few machines of the European Tour at Heston before the start on April 17.
—(*"Aeroplane" photograph.*)

On April 17 the Heston Air-Park was the scene of an event which marks a distinct step in the History of Aviation. For the first time a number of privately-owned aircraft started on a collective tour outside of the British Isles.

The idea of this tour was originated at Heston in a tea-table conversation between Mr. H. Gordon Selfridge, Junior, and Miss Slade, the Secretary of Airwork Ltd. As soon as the idea was made known a number of pilots were greatly taken with it, and so Messrs. Norman and Muntz set about making it a regular organised tour.

Communications were sent to various organisations on the Continent, with the result that official receptions were arranged by the French Civil Aviation Authorities at Douai, by the Belgian Authorities at Brussels, by the German Authorities in Berlin and by the Netherlands Authorities at Amsterdam.

Before the start on Thursday morning about 40 or 50 people were entertained at breakfast by Airwork Ltd., and after that there was an enormous amount of quiet activity while the various pilots, passengers and machines were passed by the Customs authorities and duly dispatched.

Altogether twenty machines started. The number was made up of seventeen Moths, one Bluebird, one Desoutter and one Klemm. Nearly all the machines carried passengers.

Never has one seen a cheerier party. Everybody was in a proper holiday mood. The only person who seemed at all anxious was Admiral V. H. Baker (normally Captain, late R.A.F.), commanding the fleet, and even his vast responsibility failed to remove his famous smile.

The first of the tourists is not due back till the day on which this paper is due to go to press, consequently no account of the tour can be published this week. But the adventures of the tourists will be published as far as they can be got next week.

The route arranged to be followed is as follows:—

April 17.—Heston, Douai, Ostende, Brussels.
April 18.—Brussels, Cologne, Frankfort.
April 19.—Frankfort, Wasserkuppe (to see the gliding) and back.
April 20.—Frankfort, Stuttgart, Boblingen (Klemm factory), Friederichshafen, or Constance.
April 21.—Constance (Dornier Works), Friedrichshafen (Zeppelin Works), Munich.
April 22.—Short Cruise machines return to England by way of Basel and Paris. Long Cruise machines to Salzburg and Vienna.
April 23.—Vienna-Prague.
April 24.—Prague, Dresden, Berlin.
April 25.—Berlin, Dessau (Junkers Works).
April 26.—Berlin, Hannover, Amsterdam.
April 27.—Amsterdam, Ostende, Heston.

The machines and crews were as follow:—

Long Cruise:—
G-AALX, Moth (Gipsy), J. Cantrill; Williams (mechanic).
G-AAHI, Moth (Gipsy), Nigel Norman and Miss Norman.

BEFORE THE START.—A few more machines of the European Tour organised by Airwork Ltd. before leaving Heston. This picture is, in fact, a leftward continuation of that above.—(*"Aeroplane" photograph.*)

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The GIPSY MOTH
(*Standard Model*)

Engine : 100 b.h.p. Gipsy One.
Construction : Fuselage, wings and empennage of standard wooden construction.

Abridged specification :

Colour scheme

All covered surfaces .. .. Silver
Fuselage, Struts and Undercarriage Azure Blue
Registration letters .. .. Black
(Edged white on fuselage)

**Standard instruments mounted on dash in rear cockpit.*
Airspeed indicator.
Revolution indicator.
Aneroid altitude meter.
Oil pressure gauge.
Inclinometer.
D.H. Patent Air speed indicator (mounted on strut).
*Calibrated in English or metric units, wording in any language.

Standard equipment.
Parachute type seats. Deep luggage compartment with lock. Intercockpit speaking tube system (less earphones). Engine, airscrew and cockpit covers. Tool kit. Engine, aircraft and journey log books. Engine and aircraft instruction books.

Optional equipment at extra cost.
Handley Page Automatic Slots with or without locking device, watch or clock, compass in rear cockpit, dual switches, 10 or 15 gallon auxiliary petrol tanks, aerobatic harness, duralumin airscrew or steel ditto with adjustable pitch.

Price :

Landplane—
Fly away Stag Lane Aerodrome **£595**
(Reduced from £675)

Seaplane—
Fly away Seaplane Station, Rochester, Kent £880
(Reduced from £950)
Ready for packing Stag Lane Aerodrome £855
(Reduced from £910)

The GIPSY MOTH
(*Special Model*)

Engine : 100 b.h.p. Gipsy One or 120 b.h.p. Gipsy Two.
Construction : Fuselage of welded steel, wings and empennage of standard wooden construction.

Abridged specification :

Colour Scheme

All covered surfaces .. .. Silver
Fuselage, Struts and Undercarriage Optional
(White or gold extra)
Registration letters .. .. .. Optional
(Gold extra)

Standard instruments mounted on dash in rear cockpit.
As Standard Model with addition of watch.

Standard equipment.
As Standard Model.

Optional equipment at extra cost.
As Standard Model with addition of coupé head, cockpit heating device, streamlined head-rest, compass in either or both cockpits, all standard instruments duplicated in front cockpit, oil temperature gauge, revolution indicator mounted on fuselage (visible from both cockpits), oversize wheels and tyres, spade grip on control column, detachable cover for front cockpit (with quick detachable wind-screen), 3-ply round leading edge of bottom main planes, float-on-air cushions, rubber floor mats, fescolised exhaust pipe and silencer, 10, 15, 20 or 25-gallon auxiliary petrol tanks.

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Fly away Stag Lane Aerodrome (with 100 h.p. Gipsy One) .. **£675**
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Seaplane—
Fly away Seaplane Station, Rochester, Kent (with 100 h.p. Gipsy One) £960
(Reduced from £995)
Fly away Seaplane Station, Rochester, Kent (with 120 h.p. Gipsy Two) £1035
Ready for packing Stag Lane Aerodrome (with 100 h.p. Gipsy One) £935
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WAITING IN THE RAIN AT LEICESTER.

Desford Aerodrome is the home of the Leicester Aero Club, and "—ford" means a place through which one can wade. One did.

Entering the district, which we found through the murk chiefly by virtue of Mr. Pratt, of petrol fame, his admonitory arrows by the roadside, we met an ice-cream cart making at high speed for Leicester, probably to become transformed into a hot-dog stand. That was very reasonable, seeing that there was a snowstorm then in full progress.

The nearest approach to the authentic Flanders mud that one has encountered since the slight bickering of 1914-18 was that in the Public and Members' Enclosures at the aerodrome. In spite of that, quite an unwarranted number of cars and aeroplanes were waiting as we splashed upstream,—and the gramophone loud-speaker played "Three Cheers for the Red, White and Blue."

The snow turned to heavy rain, the visibility changed from indifferent to nil, and the wind rose, but ever and anon a hardy skyfarer pushed a streaming nose through the downpour and landed. Manifold assistance was forthcoming from the A.A. Aviation Department and special details of the local police force, who worked hard in the mire on the aerodrome itself, unlike their colleagues on special point duty for miles around, of whom we passed several hunched into their capes in solitary fortitude.

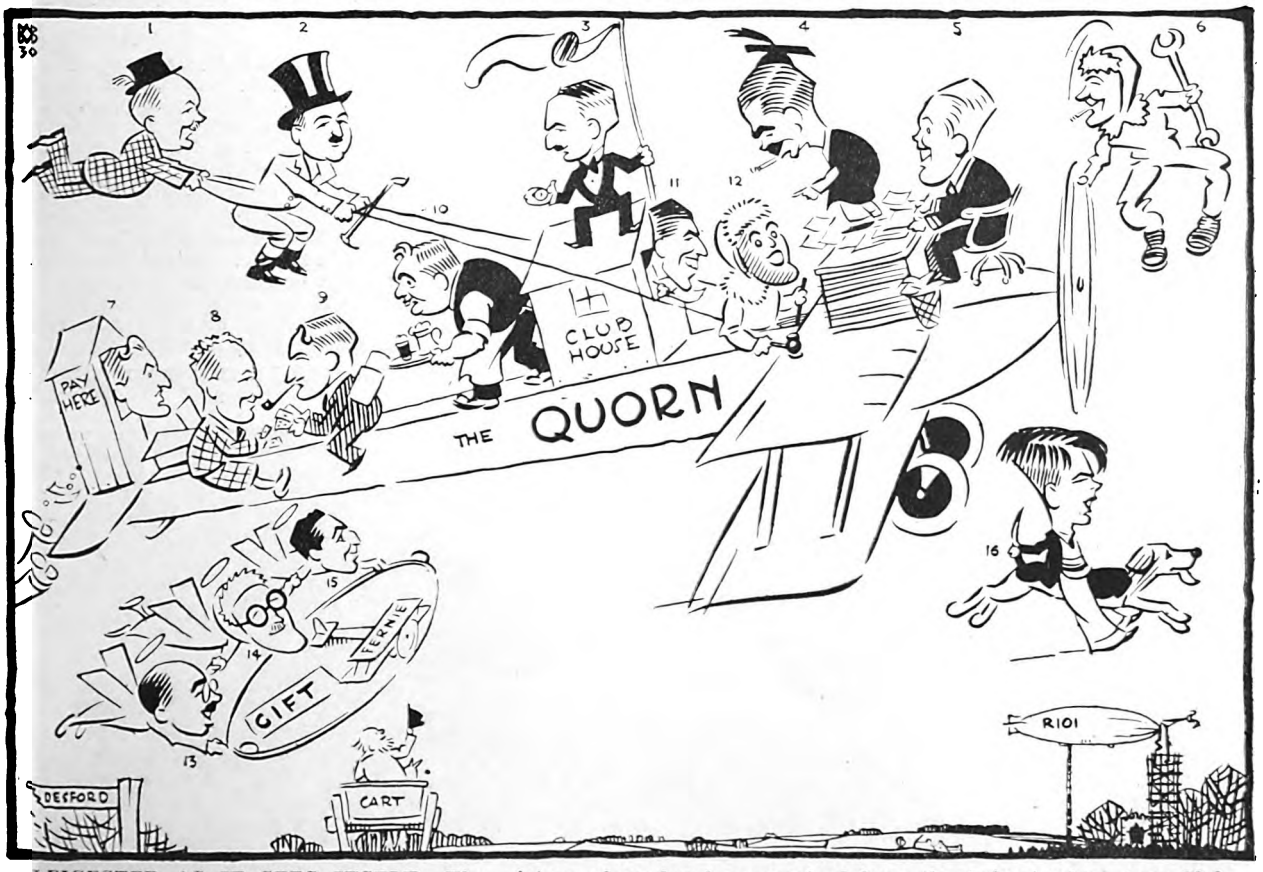
In short, the Weather Man, in a vicious outburst of most un-Easterly behaviour, dealt the Leicester Aero Club's pageant a cruel blow, and only the invincible good humour of its promoters and the pluck of visiting pilots saved the affair from being a complete wash-out.

Among those who were present up to the time that flying was cancelled for the day were the following hardy spirits:

Flt. Lt. T. Rose, who flew up the Avro V. G-ASSO with Hon. Mrs. Westenra and Messrs. Brown and Shellabear as passengers; Mr. R. R. Bentley, on his Moth, G-AAEE; Mr. N. H. Brett, Avian, G-AAHD; Miss Winifred Brown, Avian, G-EBVZ; Mr. R. G. Cazalet, Widgeon (Hermes), G-EBRM; Mr. H. D. Davis and Lt.-Com. C. N. Colson, R.N. (passenger), Moth, G-AAKJ; Mr. W. P. Cubitt, Avian, G-AAHE; Mr. N. Comper, Comper Swift, G-AARX; Flg. Off. P. P. Grey, Moth, G-EBYZ; Mr. P. Gough, Avian, G-EBYP; Capt. A. G. Lamplugh and Mr. W. Massey, Moth, G-AAEZ; Mr. Ivor McClure, Moth, G-AAAA; Mr. H. J. Penrose, Widgeon, G-AAJF; Mr. A. J. Richardson, Klemm-Salmson, G-AAFU; Mr. John Rogers, Klemm-Cirrus, G-AAWW; Lt.-Com. L. C. Sharman, R.N., Flycatcher; Mr. G. F. Surtees, Avian, G-AAIX; Mr. H. R. Trost and Mr. Clarke, Junkers Junior, G-AATH; Mr. C. S. Napier, Widgeon, G-AADE; Mr. A. G. Store, Breda, G-AAVL; Miss Slade, Moth, G-EBSA; Mr. C. H. Shearing, Klemm-Salmson, G-AATD; Mr. Norman Blackburn, Bluebird, G-AAUG; Messrs. Bainbridge and Christopher, Moth, G-AASG; Messrs. Gairdner and Wilson, N.F.S., Moth, G-AAPN; Mr. H. Andrews, N.F.S., Spartan, G-AAML; Mr. S. A. Thorn, Hermes-Avian, G-AAAJ; Mr. P. S. Allen, Hermes-Avian, G-AAVM; Mr. Gee, Moth, G-EBNF, and Messrs. Fielden and Brompton, respectively, with a sixteen-passenger Handley Page of Imperial Airways Ltd. and an Avro 504K for Aviation Tours Ltd.

This imposing array of aircraft did not arrive wholly without incident, though happily none of the delays were tragic and most had elements of humour for everyone except the person chiefly concerned. Miss Slade, with her brother as passenger, ran into the snowstorm which prevailed in the early afternoon and found hedge-hopping little to her taste, so landed in a ploughed field near Great Glenn. When she had established her position Miss Slade found her brother too much of a load to lift off the sticky furrow, and left him to ride with someone else.

Mr. A. J. Richardson, one of whose very early solo flights last year was on a compass course from Norwich across the North Sea to Rotterdam in his Klemm-Salmson, flew the same machine to Desford on Saturday. After flying blind over what is believed to have been Northamptonshire, Mr. Richardson lost his way and landed for information. In doing so he damaged a tail skid, but a local carpenter repaired it while he was confirming his geographical suspicions, and he set out strongly for Desford. If there were any real justice in Nature Mr. Richardson's stout effort would have been rewarded with something other than a large mud-puddle; but no! On alighting from the Klemm his foot slipped in one of the gooiest available, which at that time and place indicates something very special in puddles, and he made his way to the Club office in such a



LEICESTER AS IT SEES ITSELF.—The picture above has been received from the Leicestershire Aero Club and shows the thoroughly sporting spirit in which the Committee and Members of the Club view themselves. Those who appear in the picture are as follows:—1, Mr. E. T. Walker (Life Vice-President), 2, Mr. W. Lindsay Everard, M.P. (President), 3, E. A. Underwood (Secretary of House Committee), 4, Flt. Lt. Thomas (Pilot Instructor), 5, H. Purt (Hon. Secretary), 6, T. Warren (Ground Engineer), 7, B. Franklin (Financial Secretary), 8, C. E. Hurst (Chairman of Flying Committee), 9, W. B. Medcraft (Secretary of Flying Committee), 10, E. J. Tucker (Chairman of House Committee), 11, S. Brown (in Flight Office), 12, R. C. Winn (Chairman of Executive Committee), 13, H. C. Sydney Tyler, 14, T. Trevor Sawday and 15, W. A. North, J.P. (Donors of the "Fernie"), and 16, F. H. Stewart David (Pilot of Mr. Everard's machine, the "Foxhound").

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SIDE-BY-SIDE

IS ONLY SENSIBLE

"Well, old boy, if you want to push off, I'm ready."

"Right-ho, Geoff Where are my gloves? Oh, here we are. Now then."

"Do you want someone to swing the prop?"

"Oh come, Geoff, don't be Victorian! Press that little knob for me Wait a moment. Now!"

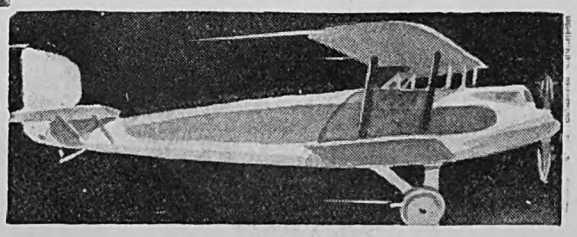
"Great Scott! Self-starter! I say this Blackburn Bluebird is simply years ahead of anything."

"Of course she is. Entirely metal construction! Side-by-side seating! Self-starter! - - "

"Marvellous! Blackburns have got away with it this time."

"Well, they've had over 20 years' experience, you know. They *ought* to know what's wanted, and it seems they do."

This machine is the outcome of 21 years' manufacturing experience .... Price £795
"Fly as you drive—side-by-side"



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A LATE ARRIVAL.—Miss Slade arriving, with the help of the excellent A.A. Staff, at Desford after being forced to land by a snow-storm.—(*"Aeroplane" photograph.*)

the engine was started. Gallant efforts by those near it prevented it from charging the Handley Page liner broadside on, but it damaged the starboard elevator of the latter and broke one of its own wings.—F. D. B.

EASTER MONDAY AT HANWORTH.

Although not fine and warm, by any means, the weather treated the Hanworth Air Pageant better on Easter Monday than the forecast warranted. It was cloudy but the ceiling was high enough to allow some excellent pilots to give of their best, and the absence of wind prevented low temperatures from telling on the spectators too severely. The public turned out very well. Some 15,000 of them througed the enclosures on the North and East of the ground, especially the former, where they must have had some difficulty in seeing details of some events.

The Fly Past which opened the programme included a specimen of each type used by N.F.S.; Bluebird, Spartan, Moth and Desoutter, to which were added for good measure a Gipsy-Moth, an Avro "Baby" and a D.H.53,—which last were the only visiting machines at the time.

Mr. H. M. Schofield then took the air for an aerobatic display which was fully up to the standard expected of an ermember of the 1927 Schneider Team. His demonstration of the Desoutter cabin monoplane, which is the standard taxi-plane of N.F.S., was a revelation of skilful handling and thorough mastery of his craft—in both senses. In fact Mr. Schofield caused a staid commercial vehicle to do everything that most fare-paying passengers would pay a lot extra to avoid.

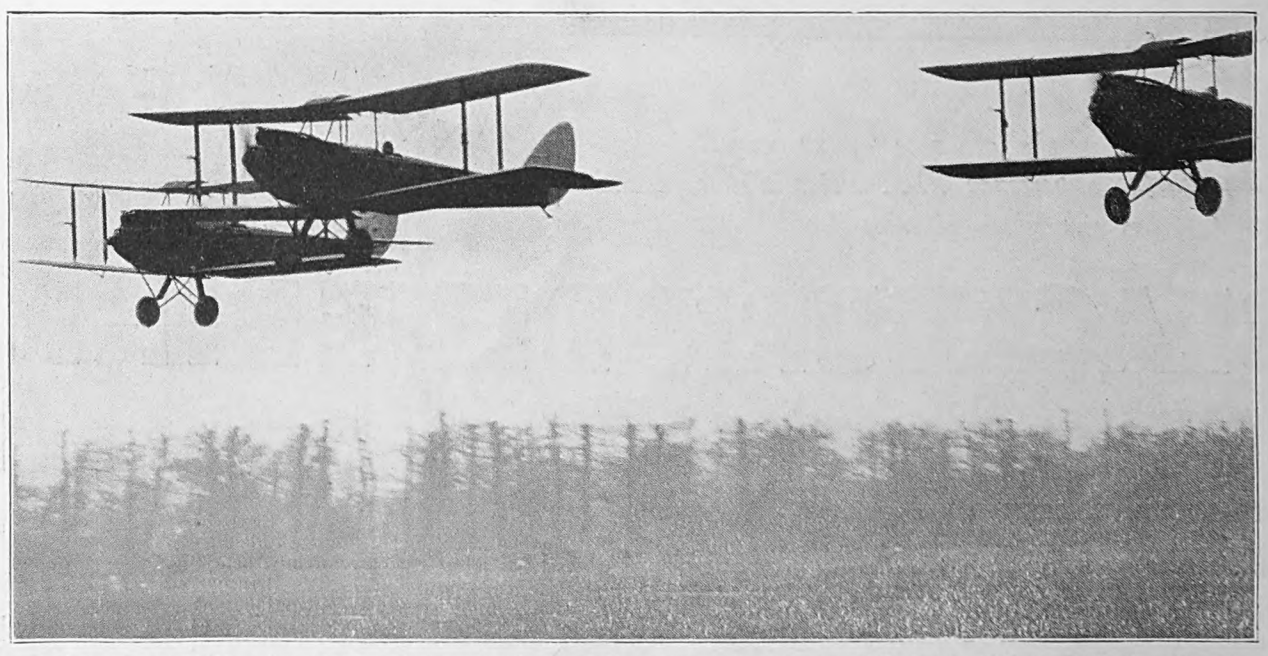
The Aerial Pool competition, which consisted of one flight over a series of circles into which flour-bags had to be dropped, was won by H. R. H. Edwards in the Avro Baby, G-EAUM. He flew very low and gained a lot in accuracy over his nearest rival, Mr. M. D. Scott, who flew a Cirrus-Moth, G-AAXG. Mr. Andrews, in a Bluebird, took third place.

The N.F.S. Circus, composed of Messrs. H. M. Schofield, J. B. Wilson and I. W. C. MacKenzie, was easily the most spectacular event on the programme. Tight formation flying, formation and concerted aerobatics, finishing with a particularly accurate formation landing, aroused a good deal of applause.

Mr. A. C. H. Rawson flew the Autogiro through its paces, to the interest and amusement of the crowd. Incidentally the almost complete absence of wind made its qualities less obvious than usual as it took some time to get the rotor turning with the slipstream deflector, and the take-off run was adversely affected.

The "All forms of transport" race gave Mr. Edwards his second win of the day. Considering that Mr. Edwards, in spite of having been in the Oxford boat this year, was not called upon to row, the "all forms" seemed rather pointed. However, he pumped up the tyre of a bicycle, rode it 150 yards, mounted a pony and rode the bewildered beast a similar distance. Thereafter he drove a car backwards to a not-very-obvious mark, carried his passenger some distance to the Avro Baby and took off.

He was away only a few seconds before E. C. Browne, on a Gipsy-Moth, which had a decided advantage in speed, but by flying his circuit low and tight he won on the post.



AT HANWORTH.—The N.F.S. Circus of Cirrus-Moths piloted by Messrs. Schofield, Wilson and MacKenzie coming in to land after giving their display The decapitated trees are noticeable.—(*"Aeroplane" photograph.*)

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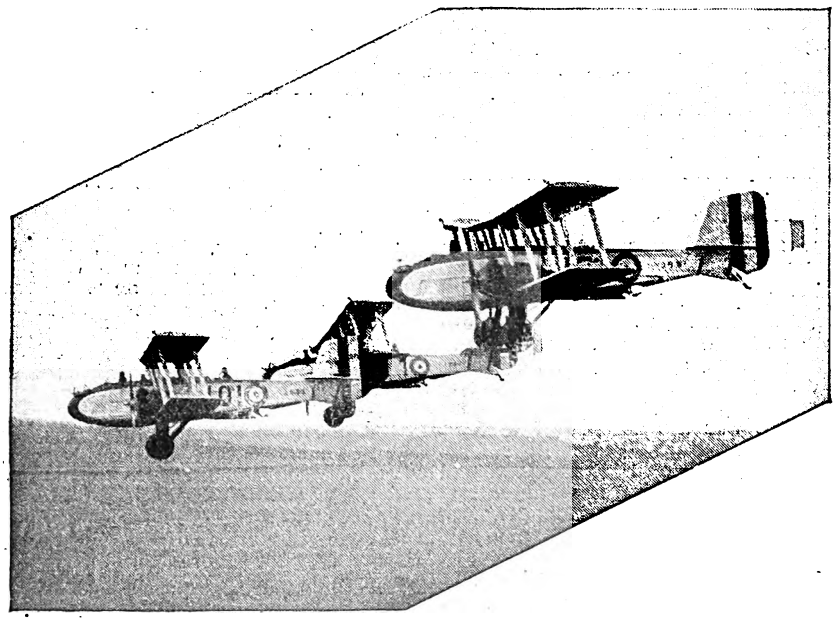
ALL-METAL AIRCRAFT



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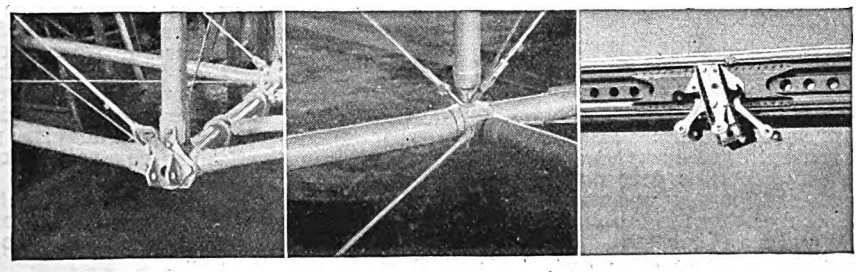

Typical details of the BOULTON and PAUL "Sidestrand." Left, fuselage and wing spar junction. Centre, a standard fuselage joint. Right, a wing spar joint for interplane struts and wires.

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The third competitor, Dr. Fleming, lost a good deal of time while carrying his passenger and came in a lap behind.

The progress of proceedings was made known to all enclosures by a very efficient Marconiphone installation. Incidentally the ground manœuvres of the transport race appealed to the announcer as an opportunity for facetious comment, and whereas he had an undoubted right to consider other forms of transport as low comedy compared with flying, there was no real excuse for framing his comments to match. Bank Holiday crowds may be used to pseudo-Rabelaisian humour, but should hardly be encouraged to expect it at the Hanworth Club.

Messrs. J. B. Wilson and I. C. W. MacKenzie took the air together for an individual display of aerobatics and left no doubt of their quality in this line. They performed all the standard evolutions with perfect accuracy and clean technique.

The final event, in which the N.F.S. Circus "bombed" a level crossing, served at least to finish things with a bang. The disappearance of the little white hut was both instantaneous and rousing.

The parachute descent by Mr. John Tranum had to be omitted from the programme owing to his absence elsewhere. He was reported to be on the way, by air, from the scene of his last descent, but one can only suppose that the pilot failed to keep him on board long enough at a time to make a fast journey.

Another disappointment was the absence of the Comper Swift, which had—rather excusably—got a little Leicester weather into its magneto system on Saturday and had not yet yielded to baking. It would have been an interesting comparison with the little old D.H.53 which Mr. Douglas was flying, as representing some years' advance in light single-seater design.

In the old days at Hendon, when the wind rose above a comparatively gentle breeze and washed out flying, the pilots used to "parade" their aircraft past the public enclosures held down by festoons of hangers-on. It was a concession to those who had paid to see flying, and rarely satisfied the crowd, but at least they saw various types of aircraft a lot more intimately than if the machines had been in the air.

The youth of the land are just as thirsty for detail as they used to be and a revival of the parade—well up to the railings—would be a useful preliminary to the Fly Past. Even the prolonged taxi-ing that would be required in a large aerodrome like Hanworth would hardly be enough to injure the engines, and when distances are so great the crowd deserves a close-up view for its money before watching specks moving afar off with really interesting flying only at intervals.

The arrangement of a flying meet to provide constant interest together with safety is certainly getting daily more difficult, but when novelties have to be introduced, such as those including other forms of transport, etc., the ground portion should be arranged to extend over as large a frontage as possible. Actually these events are better suited to small and intimate meetings.—F. D. B.

THE LONDON AEROPLANE CLUB

The London Aeroplane Club took delivery of its new D.H. Gipsy all-metal Moth on April 11. This brings the fleet of Club aircraft up to seven. The Club is now in a position to accept a few more members for flying instruction.

On Sunday, April 13, thirty-two members made solo flights, and seventeen received flying instruction. Miss E. J. Muntz qualified for her "A" licence.

Major Travers, the Chief Pilot Instructor, is taking particular interest in formation flying and already considerable progress has been made in this direction.

AN ACCIDENT AT WOODFORD.

On Apr. 13 a machine, reported by *The Manchester Guardian* as an Avro Avian, belonging to the Lancashire Aero Club, crashed near Woodford Aerodrome. Mr. Mark Lacayo, who was in the front seat, was dangerously injured. Mrs. Millington, who was in the after cockpit, learning to fly, was not seriously hurt.

A LONG TRIP ENDS WELL.

Messrs. H. L. Piper and C. Kay, R.A.F., arrived at Auckland, New Zealand, on Apr. 15. They did the last lap of the journey from Croydon by steamer, after they had flown their Desoutter-Hermes monoplane *Aorangi* from England to Australia. An aerial escort gave a demonstration as the steamer entered Auckland harbour.

A PLEASURE POSTPONED.

As The Aeroplane was going to press a telegram from the Yorkshire Aero Club announced the postponement of their Pageant from April 26 to May 10. Will all those who intended to go to Leeds for this occasion, either in earth- or air-borne vehicles, please note the alteration of date?

THE NEW DE HAVILLAND POLICY.

The De Havilland Aircraft Co. Ltd. have been trying for a long time to reduce the price of the D.H. Moth. But as each order so far has been treated individually, and as each customer has been allowed much latitude in specification, this desirable object has been impossible to achieve.

The D.H. Company have therefore decided on a definite policy under which they will offer two models of the D.H. Gipsy-Moth two-seat biplane. One will be the Standard Model and the other the Special Model.

The Standard Model land-plane will in future cost £595, instead of £675.

The Standard Model Seaplane will cost £880, instead of £950, if delivered at Rochester ready to fly. And if delivered ready for packing at Stag Lane the price will be £855, instead of £910 as heretofore.

The engine of the Standard Model will be the 100 h.p. Gipsy I. The fuselage, wings and tail-unit are of standard wooden construction. The colour-scheme will be that of the demonstration machines, which certainly look handsome. The fabric-covered surfaces,—wings, tail, fin, and the like,—will be painted silver, the fuselage, the struts and the undercarriage will be painted azure-blue. The registration letters will be painted black and those on the fuselage will be edged with white.

The instrument-board in the rear cockpit will contain a goodly range of instruments. These will include Pitot airspeed indicator, revolution indicator, aneroid altimeter, oil-pressure gauge and inclinometer. On one of the struts will be a D.H. patent airspeed indicator.

The big export trade of the De Havilland Company forces them to supply the instruments calibrated in English or metric units, with wording in any language. This service is included in the price of the Standard Model.

The Standard Model has as equipment: parachute-type seats; deep luggage-compartment with locks; a speaking-tube system between the cockpits (this does not include ear-'phones); engine, aircraft and journey log-books; engine and aircraft instruction books; covers for the engine, the airscrew, and the cockpits; and a full tool-kit.

Optional equipment can be supplied at extra cost. This includes: Handley Page automatic slots with or without locking device; watch or clock; compass in rear cockpit; dual switches; 10-gall. or 15-gall. auxiliary petrol tanks; aerobatic harness; duralumin airscrew or steel airscrew with blades adjustable for pitch.

The Special Model has either the 100 h.p. Gipsy I engine or the 120 h.p. Gipsy II engine. The price as a landplane with the 100 h.p Gipsy I engine is £675, with the Gipsy II the price is £750.

As a seaplane, with Gipsy engine, delivered at Rochester ready to fly, the price is £960,—with the Gipsy II it is £1,035.

If the seaplane is delivered ready for packing at Stag Lane, the price with the Gipsy I is £935 and with the Gipsy II it is £1,010.

The Special Model has a welded-steel tube fuselage. The wings and tail-unit are of standard wooden construction. The colour-scheme is optional, with the exception of the fabric-covered surfaces, which must be silver.

There is an extra charge for painting the fuselage, the struts, and the undercarriage white or gold. Similarly there is an extra charge for painting the registration letters in gold.

The instruments on the dash in the rear cockpit are the same as those in the Standard Model with the addition of a watch. The equipment is the same as the Standard Model.

The optional equipment at increased cost is much larger. It includes all the optional equipment of the Standard Model plus: the coupé top (or lid); a heating device for the cockpit; a streamlined head-rest; a compass in either or both cockpits; the duplication in the front cockpit of all standard instruments; oil-temperature gauge; a revolution indicator mounted on the fuselage to be visible from both cockpits; oversize wheels and tyres; spade-grip on control-column; detachable cover for front cockpit with quickly detachable wind-screen; 3-ply round leading edge to bottom main planes; "float-on-air"-cushions; rubber floor mats; fescolised exhaust pipe and silencer; and in conclusion 10-gall., 15-gall., 20-gall. ,or 25-gall. auxiliary petrol tanks.

Immediate deliveries can be given of both models, subject to extra work on the Special Model.

The difference in price between the Standard and the Special models seems quite moderate considering all that it entails. The metal fuselage alone puts anything between £25 and £50 onto the cost. Special painting may easily cost another £20. And the rest of the £80 is quickly absorbed in changing about the various items of optional equipment to please the customers.

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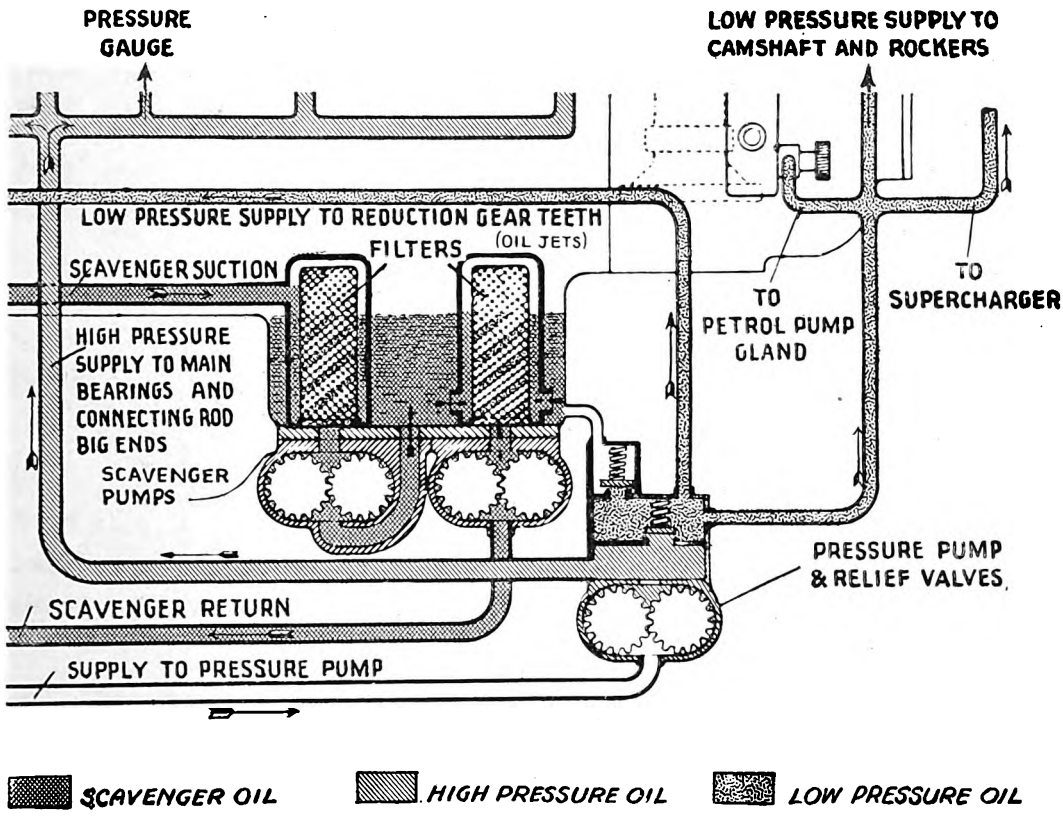

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THE AVRO TRAINER.

That ancient firm, A. V. Roe and Co. Lad., have again done a good thing. Avros have been in the forefront for some twenty years, and in the faithful old 504K, still reckoned as one of the finest, if not the finest, training machine in the world, they had set themselves a most difficult standard to beat. Their answer is the new Trainer, with Armstrong Siddeley Mongoose engine for ordinary purposes, but capable of proportionately better performance with the Lynx for special work.

The first feature one notices on seeing the Trainer in its first stages of manufacture is the use of welded tube practice on details of fuselage design. Like the Avro Ten and the Avro Five the Trainer has a steel tube fuselage which is a complete welded job, and a very clean and simple piece of work.

It is a fully trussed girder as far back as the rear of the front cockpit, in rear of which it is diagonally strutted at the sides, and wire-braced at the top and bottom and in the bays. The simple and effective Fokker method is used; that is to say, steel wire is passed through steel loops welded in the corners of the bays and the wire is doubled back on itself and tightened by a single turnbuckle.

The points of stress at the front end are particularly well strutted, especially the under-carriage attachments and the engine-mount. The juncture of four strut-ends at the middle of a crosspiece forms a complicated joint, but welding seems almost to have made it simple. The neatness of the work adds to this effect. The fuselage is assembled on jigs so that an accurate fit is assured for engine mounts and wings.

The wings are all metal, and are built with aluminium ribs on spars rivetted up from rolled strip steel.

The steel is received in a heat treated condition and is rolled in the Avro shops into approximately tubular caps and corrugated webs. These are rivetted together,—with extra rivets in the more highly stressed parts.

Steel liners and packing-blocks strengthen the spars where the nickel steel plate fittings are bolted on.

The ribs are pressed out of aluminium sheet and flanged. Where they fit over the spars two small sheet clamps are rivetted on, which makes a very tight job, and the light piano wires which run through the ribs parallel to the spars are soldered at each one, to position them longitudinally.

Double former-ribs strengthen the structure at certain points. These are made of two standard ribs joined by a rivetted cap-strip. Tubular struts and Raf-wires take the drift stresses.

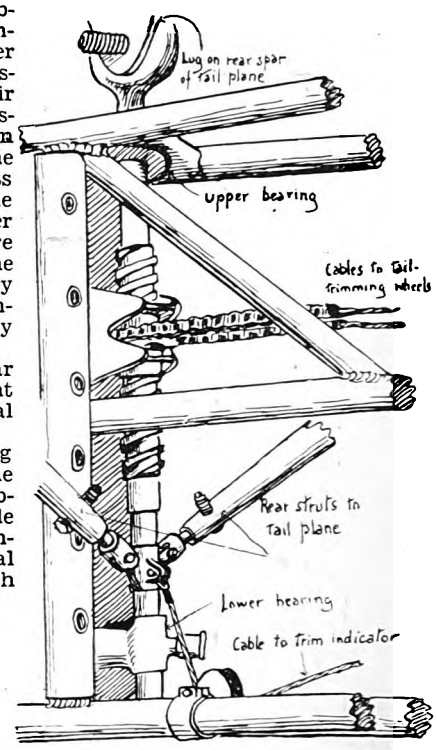
Semi-shrouded Friese ailerons are used, and operate on two ball-bearings each. The rudder and elevators, which are also built of steel tube and aluminium ribs, are also on ball-bearings.

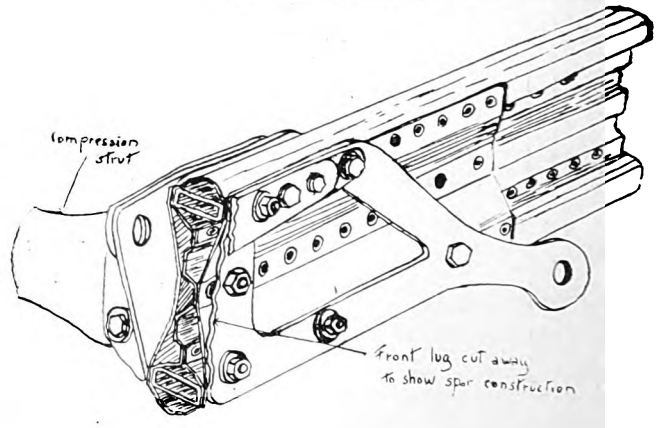
The undercarriage consists of two inverted pyramids. The radius members from each wheel meet at two points underneath the fuselage. The front one is in the middle of the first lower crosspiece, and the rear one, which takes compression loads, is the apex of a steel tube inverted pyramid underneath the rear cockpit.

The shock-absorbing members combine an oleo cylinder and rubber compression discs for their function, and transmit compression stresses from the wheels to points midway between the upper and lower longerons, which are connected across the fuselage by a very ample tubular member and thoroughly strutted otherwise.

The landing gear has about eight inches of vertical travel.

An outstanding feature of the Trainer is the absence of visible "gadgettry," combined with unusual accessibility of such





THE LATEST TRAINER.—The new Avro, with Armstrong Siddeley Mongoose engine. Above are sketches of the tail-trimming gear and of the main spar construction.—(*"Aeroplane" photograph.*)

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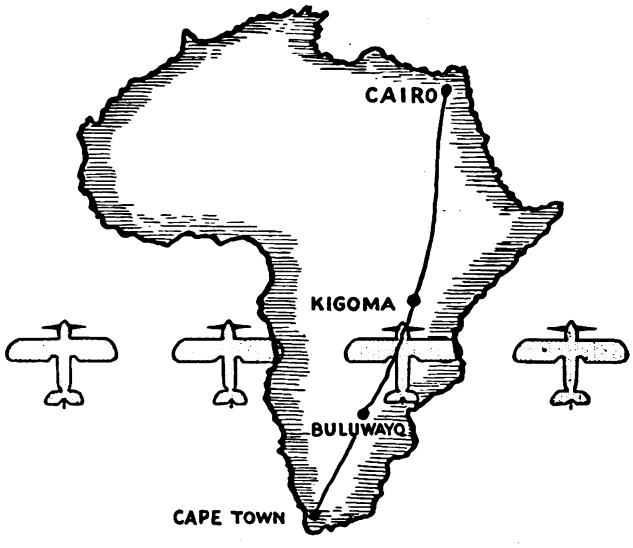
Reliability



4 WAPITIS

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gadgets as there are. The intimate details of an aeroplane's plumbing and interior economy are neither æsthetic nor invulnerable, and piping, structural details, voice-tubes, cables, both steel and insulated, should certainly be out of sight. In the Avro Trainer they are,—for they are tucked behind the cockpit upholstery between the steel-tube skeleton and the outer fairing of wood. At the same time they are made more than usually accessible by having the fairing panels quickly detachable along both sides of both cockpits.

The same decent invisibility is given to the main flying controls, by means of a raised duralumin trunk running longitudinally down the floor of both cockpits. The control-columns rise from small holes in this, and the pedals of the rudder-bars protrude through slots in its sides.

Duralumin flooring is also used between the trunk and the fuselage walls, and the trough thus formed leads through both cockpits into a trap in the bottom of the fuselage at the rear. Anyone who has stood on his head scooping mud out of cockpits with his hands will appreciate what this means, especially as there are no obstructions or inaccessible corners.

Both instrument-boards are identical and complete, and so are the controls for the engine, tail-trimming and slots. The slots can be locked, or released for action, and a sliding indicator in the right wall of each cockpit shows the amount of tail-trim.

The tail-trimming gear has an unusually wide range of adjustment. Half of it is made by interconnected wheels, one in each cockpit, and the remainder by adjustment on the ground. The leading edge of the tail plane is held in bearings on vertical rods which can be moved up and down in their housings and positioned by screw pegs in a series of holes. The front bracing-struts also have a sliding anchorage at their lower ends. The trailing edge, to which are hinged the elevators, is supported on a single central bearing on a vertical rod and is braced by two tubular struts which meet at a fitting nearly at the bottom of the same vertical rod.

The rod is threaded between its two bearings, and a threaded sprocket which is turned by a chain and cables from the cockpit thus raises and lowers the whole trailing edge installation. The functioning of the elevators is not affected. A cable leading from the strut-fitting on the vertical rod, downwards under a pulley and forward to the cockpit, there actuates an indicator to tell the pilot or student exactly how the tail is trimmed.

In action the Avro Trainer achieves its purpose of being a safe aircraft which is still capable of flying through advanced aerobatics. The controls are particularly light. The mechanical friction is reduced to a minimum by the generous use of ball races at all stressed points.

The ailerons which were at first toned down to suit the natural stability of the machine, have since been given more sensitivity to make advanced aerobatics easy.

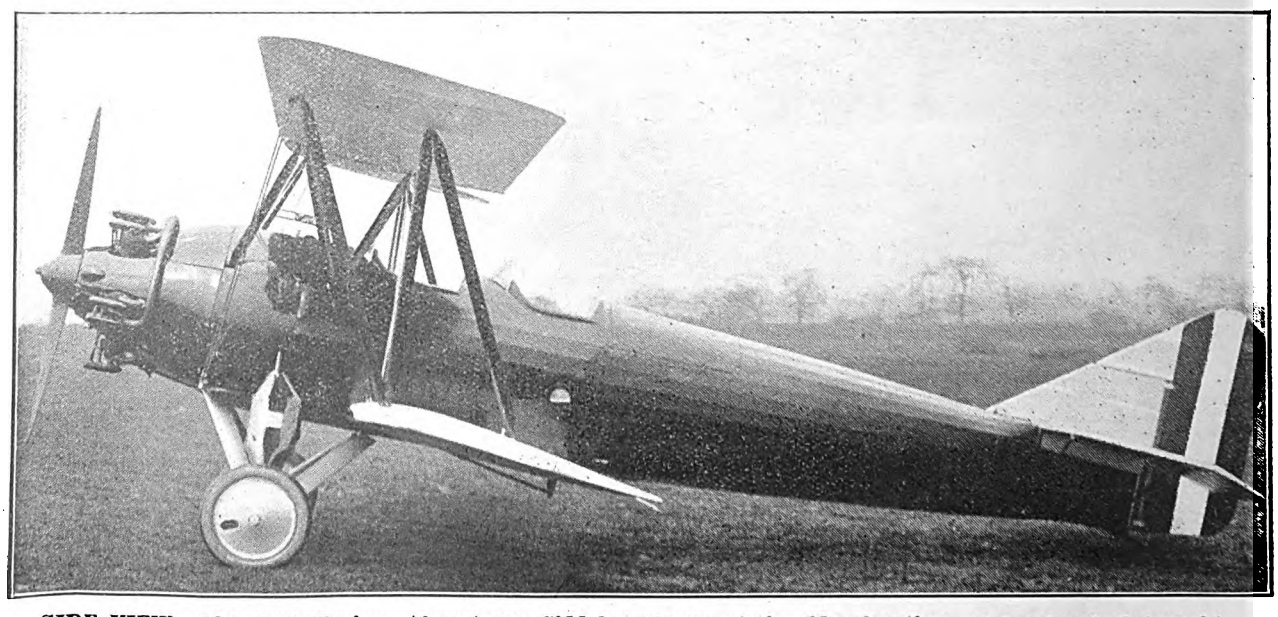
The undercarriage does not damp bad landings out to a point where the student remains ignorant of his error, but has a tremendous capacity for protecting the structure.

A special, and very simple, device for raising and lowering the seats at the pleasure of the occupants is noteworthy. A lever and rack is placed conveniently to the right hand of each cockpit, and this lever rotates a transverse tube under the seat which carries the arms to which the chair is fastened. Similar arms from another tube above and to the rear preserve the relative position of the chair as it rises or falls. This feature is excellent for short or tall operators and not only adds to the bodily comfort of the pilot on a long flight when he can sink well into shelter, but also to his mental poise when visibility is bad and he is able to emerge and see as much as possible.

AN EXPERIMENT.—A Trainer with an Armstrong Siddeley Lynx engine.—(*"Aeroplane" photograph.*)

Each rudder-bar is adjustable through quite a wide range of leg-lengths by an exceedingly handy little knurled wheel which protrudes from the duralumin trunk between one's feet. The rudder is really actuated from a longitudinal slotted housing which has a threaded rod running through it lengthwise. The rudder-bar is engaged by this thread and thus moves to and fro in the slot while still governing the rotary movement of the housing. The knurled wheel turns the threaded rod by a universal point.

Nothing is quite so elusive as real excellence in an aircraft, and if the Trainer can produce flying virtues to compare with its obvious merits in design it will be a worthy successor to the famous 504K.—F. D. B.



SIDE VIEW.—The Avro Trainer (Armstrong Siddeley Mongoose) in side elevation.—(*"Aeroplane" photograph.*)

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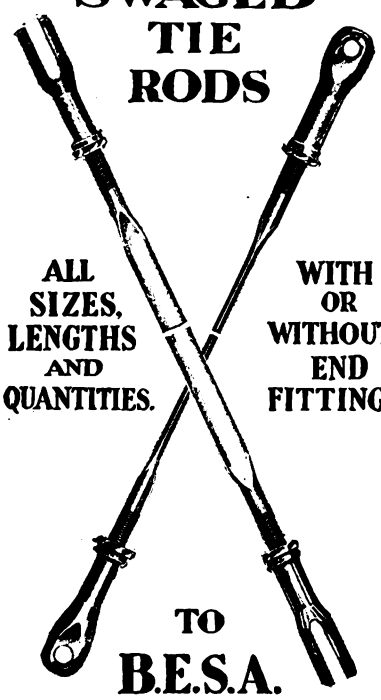

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COMMERCIAL AERONAUTICS.

THE NEW ROUTE TO INDIA.

On April 12 the first India Air Mail to cross Europe by the new route left Croydon on the outward journey and reached Karachi one hour ahead of schedule time on April 19. This is the first time that the mail has done the journey in seven days.

The route, instead of going south across Europe to Genoa now goes across Germany, Austria, Hungary, and Jugo-Slavia to Salonika, where the freight is transhipped to Short Calcuttas and flown down to Alexandria by way of Athens and Suda Bay, Crete. From Egypt the new air-route links with the original route.

The first stage on the new route is to Nuremburg, where the first night is spent; the second stage is to Skoplie (formerly Uskub, in Serbia). Thence the freight is sent by the night train to Salonika. This train link is only temporary and will be used until the lengthening days and Summer Time make possible the flying of longer stages.

One learns that the various Central European countries are very glad to have Imperial Airways liners flying across their territories. Their hospitality is embarrassing, and because of their desire to have the air-line stops at their various important cities the stages are perhaps shorter than such stages might have been.

The various governments revel, too, in the filling of forms, so that a vast amount of literature is carried by every Argosy.

The new route, however, seems likely to become popular with the European States as it collects their mails at each several halt. One can imagine a time when the air-mail systems of each State feed regularly into the Grand Trunk line of Imperial Airways.

One wonders how such a development will be affected by the K.N.I.L.M. route to the Dutch East Indies, which is to start on Oct. 1 and will to some extent run parallel to Imperial Airways. Apparently the K.N.I.L.M. machines will only take aboard mail at their own aerodrome in Holland.

The development of locally-run feeder lines to the India Route may be somewhat retarded by the local postal systems asking too great a surcharge for air transport,—a matter in which our own Post Office is comparatively generous.

Our own Post Office can be quite thoughtful, too. When the new route to India was opened the Post Office found that the mails sent by steamer to Alexandria for air transport, thence along the India Air Route, would miss their connection. This was because of the increased speed made across Europe. Our Post Office therefore collected all these mails and took them to Croydon for air transport all the way. And this with no extra charge, and at a loss to the Post Office!

THE LONDON—INDIA SERVICE

In the House of Commons on April 9, in reply to a question by Mr. Mander, the Under-Secretary of State for Air said that there had been no change in the policy of the present Government as against that followed by the previous Government with reference to the Anglo-Italian Air Agreement for the operation of the London—India air service. The negotiations had broken down on Feb. 26, because it had been found impossible up to the present to conclude with the Italian Government arrangements which were commercially satisfactory to Imperial Airways Ltd.

A LOGICAL DEVELOPMENT.

A return night mail service was inaugurated by Sabena between Brussels and London on the night of Monday, Apr. 14, and the early hours of the following morning. At 23.30 hours a three-engined Fokker left the Haren aerodrome for Croydon with Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, and General Van Crombrugge, Director of Belgian Civil Aviation, on board. It arrived at 01.30 hours, half an hour after a similar machine had left Croydon for Brussels, where at arrived at 02.30 hours. These will be the regular times for the nightly service.

About 440 lb. of mail came from Brussels in the first load, and the outgoing quantity was slightly less.

When the public realise that letters can be accepted in the General Post Office, London, up to 23.30 hours for early morning delivery in Brussels, and up to 22.00 hrs. in Brussels for the first morning delivery in London, the advantages of the service, and the logical enterprise of the Belgian Post Office and the Sabena officials, become obvious.

LICENSED AERODROMES.

In the House of Commons on Apr. 16, in reply to a question by Mr. Louis Smith, the Under-Secretary of State for Air said that the number of licensed civil aerodromes in Great Britain and Northern Ireland was 127, of which five were State-owned, five were municipal-owned, and 117 were privately-owned. In addition there were 48 R.A.F. Aerodromes.

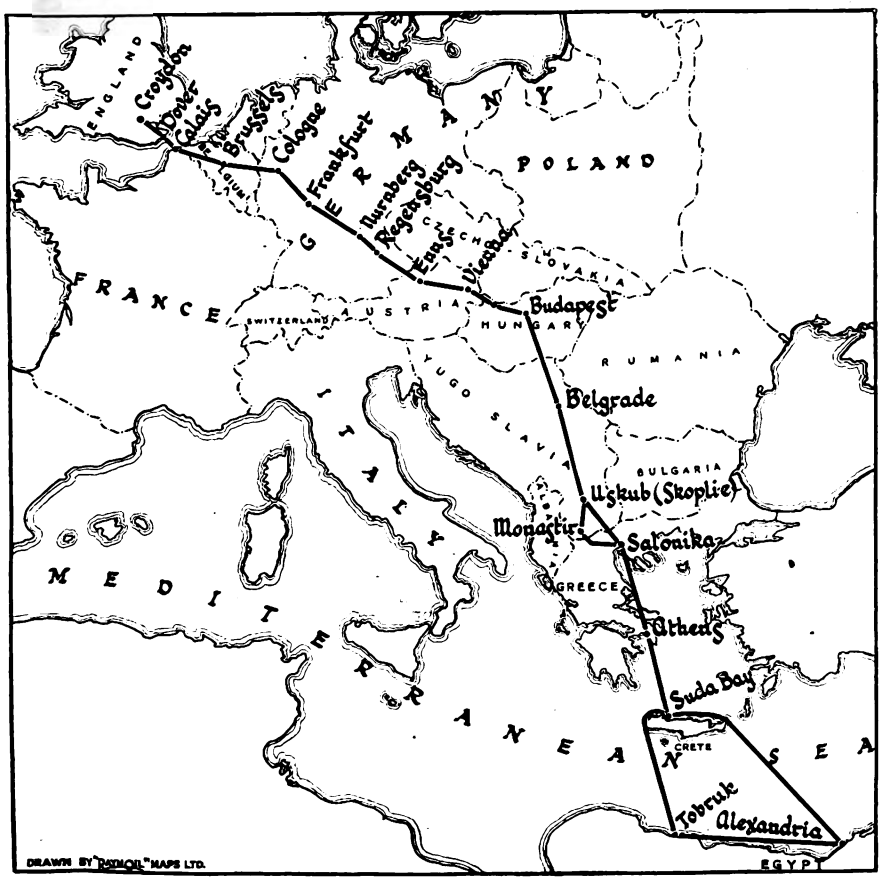
All the counties of Wales except Flint, and the following counties of England, were without aerodromes:—Cumberland, Westmorland, Shropshire, Rutland, Huntingdonshire, Monmouthshire, Herefordshire, and Cornwall.

THE "GRAF ZEPPELIN" AT LARGE AGAIN.

After a period of quietude in its home hangar at Friedrichshafen the *Graf Zeppelin* emerged on April 15 and flew to Seville, where it arrived about 24 hours later. After cruising to Cadiz the airship returned to Seville and moored there at 5.30.

King Alfonso and the Royal Family were at the aerodrome to watch the mooring process, and to greet the commander, Captain Lehmann, and his crew. As there is no mooring mast at Seville the Zeppelin was held down by 200 Spanish soldiers for the hour or two of its stay.

The Times correspondent in Berlin reports that the *Graf Zeppelin* will make a flight over the North Sea on Saturday, April 26, and will moor at Cardington, where Dr. Eckener, who is now in England, will take over command from Captain Lehmann. This will be the first time that a German Zeppelin has landed in England voluntarily.



The new route of Imperial Airways across Europe to Egypt. This map has been specially drawn fo "The Aeroplane" by Rainoil Maps Ltd.

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A NEW VENTURE.

Mr. F. Gough, who was one of the founders and for several years Secretary of the Norfolk and Norwich Aero Club, and Mr. N. Brett,—each of whom owns an Avro Avian,—have just secured a licence for a private aerodrome seven miles from Norwich on the Norwich-Fakenham road.

The aerodrome itself is square and covers an area of 20 acres. There are no trees or hedges near it within a quarter of a mile in any direction so it is as effectual as an aerodrome many times its size. There is an excellent shed on the aerodrome, for two machines, and supplies of Wakefield Oil and B.P. petrol are kept there.

Messrs. Gough and Brett are running the aerodrome purely as a hobby and not for profit, and they will be pleased to see private owners and others there at any time. As a sideline they want to do some aerial photography, so they would be glad to hear from anybody who has a good second-hand aerial camera, suitable for use in an Avro Avian, for sale. Replies should be sent to Mr. F. Gough, Meadow Creek, Drayton, Norfolk.

A DE HAVILLAND CELEBRATION.

The President, Staff and Students of the De Havilland Technical School will celebrate their 100 per cent. success in the Air Ministry Ground Engineers' Examinations during the past Session, by holding a dance at the Portman Rooms, Baker Street, W.1, on May 9.

The Committee will be pleased to welcome all members of the Aircraft Industry. Tickets are available at 4s. single and 7s. 6d. double, and application should be made to Mrs. Upton or Capt. A. T. Eadon, Stag Lane Aerodrome.

Several eminent members of the Aviation World have expressed their intention of being present.

CROYDON NOTES.

Aerial attendance at the Boat Race was so good that the voice of the Official Broadcaster was said to have been obscured by the roar of aero engines at times. As a matter of fact, it was a gentleman from Bootle with asthma sitting behind the Broadcaster who really made the noise.

Imperial Airways Ltd. sent three fully-loaded Argosies to the Boat Race, and among other aircraft present was an Avro 5, but it is not known under whose flag it flew.

Talking of shipping, there was considerable confusion in the Channel on Friday and Saturday (April 11 and 12). On Friday, according to the Press, most cross-Channel boats moved dismally through the fog dead-slow and nearly all vessels reached port very late, to the alarm and discomfort of passengers. On Saturday an Italian boat came to roost on the Goodwins and was later ingloriously washed off by the tide like a bit of driftwood. The same day a boat, very rightly named the Invicta, was navigated into the Jetty at Calais, doing that useful piece of furniture a lot of harm, but remaining unscathed itself (or, herself?).

While shipping magnates were praying for the speedy construction of the Channel Tunnel, so that they could put their boats on wheels and the wheels on lines, commercial aviation carried on exactly as usual during Friday and Saturday, and the Sabena night service ran to schedule both nights.

The B.B.C. and the Press, who never miss an opportunity of pointing out that air liners were held up for fog, quite often doing so in the face of definite evidence to the contrary, were discreetly silent about aviation on this occasion.

The public would be definitely interested to learn that while Channel shipping was all of a doo-dah, proceeding sideways with its eyes crossed and its syrens screaming blue murder, the cross-Channel air services were undisturbed.

Actually, what Civil Aviation wants, as firms' Publicity Departments ignore matters of this sort, is to sink all differences of race and creed and form one of those jolly little communal secret societies, such as the one which suddenly instructs the World to "Eat More Fish," leaving the choice of the fishmonger to the individual and allowing him to devour shark, squid, shrimp, lamprey, pilchard, prawn, porpoise, or winkle at his own risk and discretion.

In brief, we want to get together and simply say, "Fly, darn you, Fly!" to the Public.

Mr. R. B. Waters, late pupil of Col. Henderson at Croydon, has started a business at Penshurst Aerodrome, entitled "Home Counties Aircraft Services," which appears to be doing well. It includes joy-riding, instruction and air taxi work, and Mr. Waters is fortunate in having the local Press on his side (so different from London, what?).

The Kent and Sussex Courier has given him excellent publicity in its columns, and has, moreover, offered its readers 50 joy-rides with Mr. Waters.

He himself, though prepared to work all day and all night, probably regards the whole thing as a sort of rest-cure, having spent a good deal of his life on the High Seas and some years of it driving Overland Desert Mail Transport in Syria amidst a hail of bullets from hostile Arabs. In his spare time he went motor-bicycle racing, or tried to ride one of those foul contraptions from the Cape to Cairo.

Mr. Waters is full of energy, initiative and business acumen, as witness his offer to sell anyone a new or part-worn aircraft on the never-never system for £50 down. The Nobility and Gentry of Penshurst are said to be tumbling over each other to learn to fly, and we hope Mr. Waters meets with the success his enterprise most certainly deserves.—SPRY.

We have been wrestling tooth and nail with our Dentist lately, we having the tooth (at first) and the Dentist the nail, or something very like one. This is no game for the amateur who ends up minus the tooth and does not get the nail. The Dentist wins the prize and the other bloke not only loses all his knobs of ivory but pays heavily for the fun the Dentist has had. Otherwise it is a fair and sporting contest.

Thus we know little or nothing and make our excuses for these notes in advance.

Easter bookings have been very good apparently, Imperial Airways have had to duplicate Paris services several times during the holiday period.

K.L.M. had a 2½ ton load of cut flowers for Covent Garden Market on Easter Monday and have been importing quite large consignments of Dutch plovers' eggs into this country. Thus the idle rich, sated with turtle soup and caviar, have been able to soothe their jaded palates with these eggy but gelatinous dainties.

What has happened to the British Plover? Apparently the Society for the Prevention of Promiscuous Ovipositing among Peewits has stepped in and forbidden these dolorous birds to lay any more eggs. Hence their despairing wails.

Imperial Airways had a car waiting outside the Paris Stadium for special passengers who were driven straight to Le Bourget after the Rugger match and flown to Croydon. Thus these enthusiasts having witnessed the defeat of France by Wales were able to nibble a leek at dinner-time in London, in honour of the victory—whateffer.

Mr. Macintosh recently left Paris in Major Holt's three-engined Fokker fifteen minutes after a well-known brand of Air Liner and reached Croydon sixteen minutes before that High Speed conveyance.

Imperial Airways are now booking through passengers from England to India by air and had their first two bookings not long ago.

Night Watchmen all the World over intensely resent having their night's repose interrupted. This night-flying must be most upsetting for those whose job it is to watch for them, as no less than five machines took off or landed at Croydon between 01.00 hr. and 04.00 hrs. recently.

Messages of sympathy from a brother Watchman situated in a box on the Purley Way are said to have been received in the Control Tower.

This gentleman not only lost a night's rest, but his supper bloater as well. He was cooking the elusive fish over his bucket of coals when an aeroplane overhead "give him such a start, he dropped the blinking bloater in the bucket." It flared up and vanished with a pop of course, and its owner is writing to his Union about it.

According to a Daily Paper, Whitehall is to be reconstructed on the lines of a Paris Boulevard, and planted with umbrageous trees. Seeking an interview with (say) the Deputy Director of Cracks in Ceilings some sunny morning, we shall probably be conducted to a shady corner of the new Whitehall, where, under a pink and green awning the Deputy Director will be found wearing a black sombrero and an equally sombre spade-shaped beard, reading *La Vie Parisienne* and waiting for his morning absinthe to percolate the lump of sugar or vice-versa, as the case may be.—SPRY.

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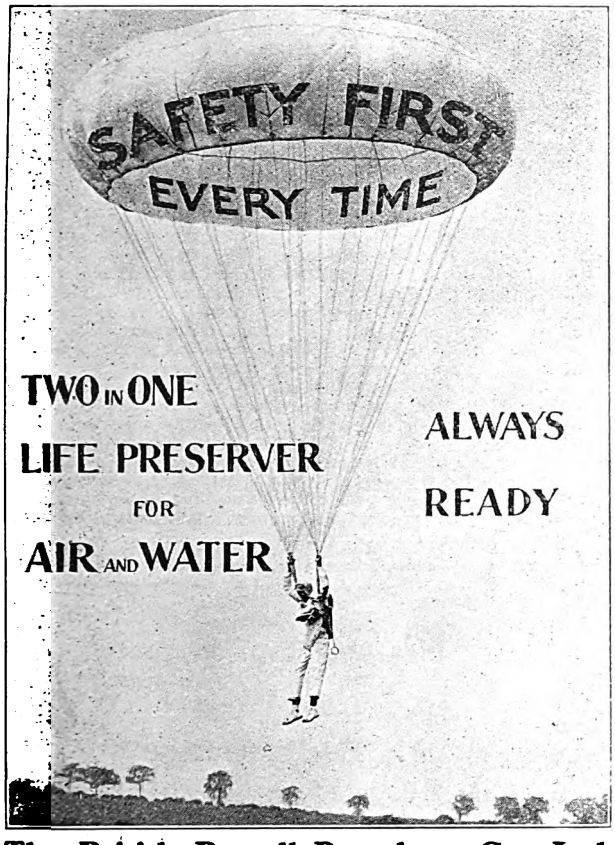

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The Berks, Bucks and Oxon Cup race, on April 5, was won by Miss Spooner at 106.5 m.p.h., piloting a GIPSY MOTH, using CASTROL.

CINQUE PORTS F.C. MEETING
AT LYMPNE

The 3rd Ashwell-Cooke Cup Competition on April 6 was won by Mr. R. Dallas Brett, piloting a CIRRUS MOTH, using

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NEW COMPANIES.

Arrow Aircraft (Leeds) Ltd.—Private company. Registered April 9. Capital, £5,000 in £1 shares. Objects: To acquire the business of manufacturers of aircraft and the component parts and accessories thereof, and mechanical and general engineers carried on by A. C. Thornton, S. Oddy, H. Dowson, W. Kenworthy, I. M. Brown and H. Broadbent, at Whitehall Road, Leeds.

The first directors are: A. C. Thornton, Luxor View, Harehills, Leeds, designer. S. Oddy, North Park Grove, Roundhay, Leeds, draughtsman. H. Dowson, I. M. Brown, W. Kenworthy (addresses not stated). H. Broadbent, 2, Basinghall Square, Leeds, solicitor.

RECEIVERSHIPS (APPOINTMENT OR RELEASE).

"Wings" Publications Ltd.—R. S. Andrews, of 448, Strand, W.C.2, ceased to act as Receiver on Mar. 26, 1930.

PERSONAL NOTICES.

Births.

KELLY.—On Mar. 1, at a nursing home, Bangor, to Kathleen (*née* Knox), wife of Wing Cdr. T. J. Kelly, M.C., M.D., R.A.F. Medical Service, Sarafand, Palestine—a son.

THOMAS.—On April 12, at Cranwell, Lincs, to Olive Lee, wife of Sq. Ldr. M. Thomas, D.F.C., A.F.C.—a daughter.

WEBB-BOWEN.—On April 16, at 3, Prince Edward's Mansions, Hereford Road, to Violet, wife of Air Vice-Marshal T. T. Webb-Bowen, C.B., C.M.G.—a daughter.

Forthcoming Marriages.

ELMHIRST—BLACK.—The engagement is announced between Sq. Ldr. T. W. Elmhirst, A.F.C., R.A.F., son of the Rev. W. H. Elmhirst and Mrs. Elmhirst, of Elmhirst, Barnsley, Yorkshire, and Katharine Gordon, daughter of Mrs. Black and the late William Black, Chapel, Kingskettle, Fife.

McENTEGART—PATMORE.—The engagement is announced between Sq. Ldr. Bernard McEntegart, R.A.F., third son of the late William McEntegart and Mrs. McEntegart, of West Derby, Liverpool, and Anne, youngest daughter of Mrs. Patmore, Brae, near Dumfries, Scotland.

WILLETTS—WHATLEY.—The engagement is announced between Mr. A. H. Willetts, R.A.F., second son of the late Mr. A. J. Willetts and Mrs. A. J. Willetts, and Nancy Hughes, elder daughter of Mr. and Mrs. W. Hughes Whatley, of Trentham House, Emsworth, Hampshire.

Death.

RALLI.—On April 17, at Ealing, Pandia Antonio, only son of the late Antonio Pandia Ralli and of Hypatia Ralli, 2, Place Montbenon, Lausanne, Switzerland, in his 42nd year.

Mr. Ralli, who was of Greek parentage, was educated at the Gymnase Scientifique at Lausanne where he studied mathematics and physics, and took his diploma as an electrical engineer.

A friend of Mr. Ralli's writes:—

The death of Mr. P. A. Ralli after a short illness of a few months on Thursday, April 17, has deprived not only the Aircraft Industry but also the Scientific branch of aeronautics in England of one of its leading technical men. Trained originally for electrical work, he was a master of physics and mathematics and quickly adapted himself to the new science during the War, when he joined the technical staff of the Fairey Aviation Co., Hayes, in 1916.

In 1924 he was appointed Head of the Technical Department of that Company, a post which he held until his death. As such he has done most valuable original research affecting the strength and performance of high-performance aircraft.

His airscrew design and mathematical analyses resulted in a solution of the problems of providing metal airscrews for high-powered racing aircraft. This work did much to enable this country to win the Schneider Trophy back from Italy in 1927. For this and his research work on airscrews he was awarded the Silver Medal of the Royal Aeronautical Society in 1928. He was again successful in his airscrew designs for the 1929 Schneider Trophy Contest.

Mr. Ralli was by nature of a retiring disposition but to his friends, his co-workers and his staff he will be remembered by all as one always ready to help, explain or instruct in the many aeronautical problems which continually arise. Many of our present young technical men in aviation owe a very deep debt of gratitude to him for the soundness of the training he so unselfishly gave.

As a man his conversational powers on scientific matters were unique, enriched as they were by knowledge gained from the many French, Swiss and German authorities with whom he was acquainted. His arguments were always sound and proved in practice. Although he was thought by some to be dogmatic, one could discern a subtle vein of humour which tempered any mathematical discussions which came his way. His hobbies were few,—the reading of a Continental treatise on some new problem in physics, mathematics or aeronautics formed his ideal week-end pastime.

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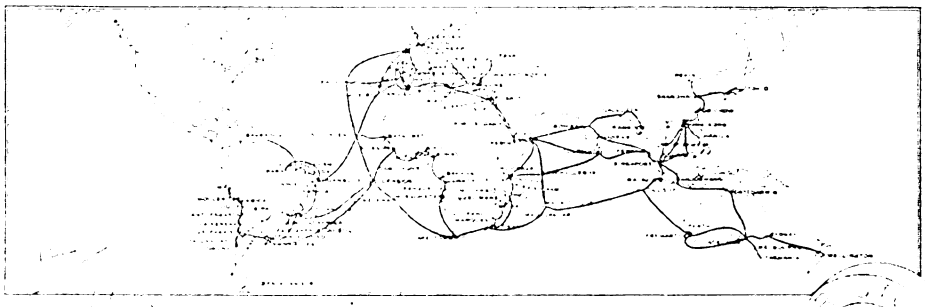

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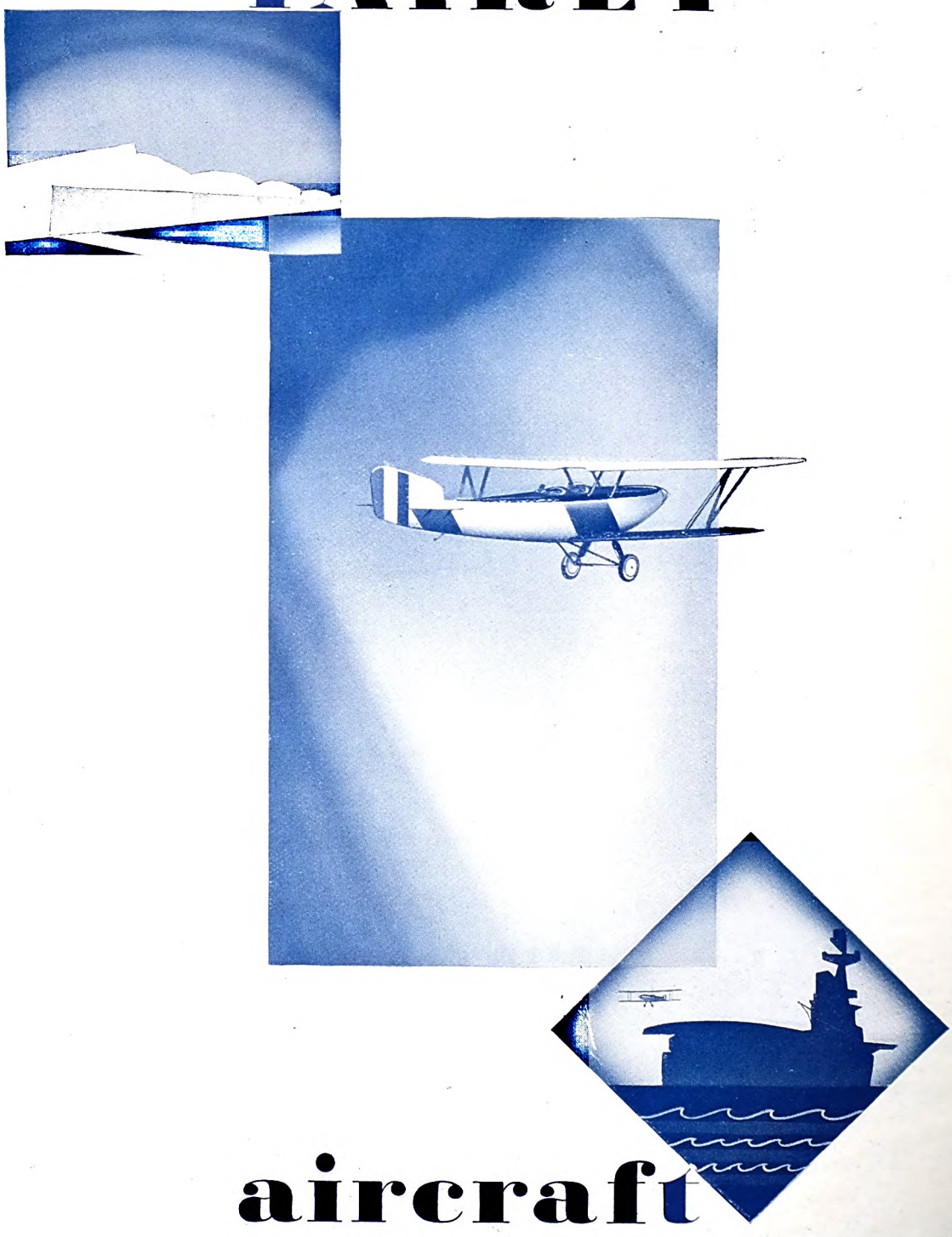

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ON THE IMPORTANCE OF PORTUGAL.—IV.

PROGRESS IN PORTUGAL.

The work the Government has done during the past few years is quite remarkable. Although the Nation's income is limited and the Government has been so wise as to live within its income, quite remarkable progress has been made.

Roads have been laid round about Lisbon and are being laid all over the country which are quite as good as any we have here, though they are certainly narrower. And, incidentally, the chief of the road-making department is one Robinson, an Englishman, who—judging by the results—knows a heap more about road-making than do most of our experts in this country, and is worthy to rank with the able Mr. Bean of Northumberland.

There are still many thousands of miles of road to be laid in Portugal, and consequently motoring about the country is something of an adventure. But there are quite enough good roads to give pleasure in between the pain of the bumpy roads. And they do indicate what will happen in the course of the next few years.

The railway system of Portugal has been completely reorganised and is now quite as good as anything on the Continent of Europe. That, for some curious reason, is being done by Belgians, backed by Belgian capital. Between Lisbon itself and the seaside resort of Estoril, a matter of 20 miles, there is an electric railway which one says without hesitation is the best in Europe for comfort and efficiency. Also its service starts at 5 o'clock in the morning and runs about every ten minutes till after 2 o'clock the next morning. And that is better than any of our London tubes.

It means that the Lisbon people can go and enjoy themselves at the Casino at Estoril and can come home comfortably in the small hours of the morning, or contrariwise, people who live at Estoril can spend a pleasant evening in Lisbon and get home without spoiling the party. In which matter the Portuguese are ahead of us.

Also Lisbon has a telephone service which is quicker than ours, and much more civil. It, like the roads, is the work of an Englishman, a certain Mr. Pope, whose proudest boast is that he, serving with the Independent Force, R.A.F., in 1918, was able to put General Trenchard, in the East of France, into direct telephonic communication with the Secretary of State for Air, Sir William Weir, at the Bolo House, Strand, London,—thanks to the loan from the American Expeditionary Force of telephone boosters which did not exist elsewhere in Europe. Mr. Pope is now busy automatising the Lisbon telephones, and by next year Lisbon will again be ahead of London.

Another matter in which the Portuguese, or at any rate the people of Lisbon, are far ahead of us is in their taxi service. Instead of our curious cramped little vehicles, the Lisbon taxis are quite luxurious American touring cars And they are all remarkably cheap. But the most remarkable thing about them is the way in which they are driven.

In the whole of Lisbon there is hardly a hundred yards of level road, with the exception of the strip along the quay, which is perhaps 300 to 400 yards wide. The rest of Lisbon varies between slopes of about 1 in 30 and 1 in 5. Up and down these the Lisbon taxis travel at a speed which even the most phlegmatic of London policemen would regard with alarm. And apparently they never have an accident. The way in which the Lisbon taxis are maintained is only equalled by the way in which the Portuguese Military and Naval aeroplanes are maintained.

Also the Portuguese Government, or rather the Municipality of Lisbon, are remarkable for the fact that, unlike us, they do not issue motor-driving licences to the maimed. the halt and the blind. To get a driving licence in Portugal you have to pass a driving examination which would put out of action at least 50% of the motorists in this country.

For the purposes of these examinations the Lisbon authorities use a vehicle which one has never seen anywhere else, that is to say, a dual-control taxi. Nowhere else has one seen a motor-car with two steering wheels and complete duplicate controls.

The wretched candidate for a licence is planted in one of these strange vehicles alongside an examining driver, and he is set to do things which would shake the nerve

"HE WILL UNTREAD THE STEPS OF DAMNED FLIGHT." (SHAKSPEARE—*King John.*)

THE PEACE-MAKER.—The "Graf Zeppelin" just rising at Cardington after its visit of good comradeship.
—("*Aeroplane*" *photograph.*)

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of some quite good drivers in this country. If he is a bad driver he is saved from disaster by the skill of the examiner. And if he satisfies the examiner he is a first-class driver.

After having been scared nearly to death by our first and second trip in Lisbon taxis, one was told of this examining process, and thereafter one thoroughly enjoyed the experience of being hurtled down what looked like cliffs and shot up hills and round corners at speeds which could only be achieved by extraordinary skill.

Having driven motors of various sorts for something well over 30 years, one was duly impressed by the skill of the Portuguese. And the skill certainly increases one's confidence in the possibilities of Portugal and its people for aviation, as indicating quick physical reactions and good judgment of speed and distance.

This is all by way of giving readers of this paper, some kind of an insight into the ways and manners of Portugal. Let us again return to the subject of the Lisbon Air Port.

The Lisbon Air-Port.

The existing Air Port is at the Military Aerodrome at Alverca, which has already been described. It is between 18 and 20 miles from Lisbon and by no means can this journey be done in much less than one hour, until such time as the Portuguese Government has practically abolished many miles of narrow street through which at present cars can only proceed at less than a walking pace because they are cumbered by bullock-carts which bring agricultural products in from the country on that side. In any case, the idea of having the capital's aerodrome 20 miles away from it, is ridiculous.

What the Portuguese want is a combined aerodrome and seaplane station on the North bank of the river as close to Lisbon as it can be got. And that is the proposition to which one would like some of our great engineering contractors to direct their attention. It is well worth their while, because some day it is going to be one of the World's greatest Air-Ports,—just as some day Jaffa, on the coast of Palestine, is going to be one of the World's greatest oil ports, though it does not look much like it at present.

There is any quantity of partly-reclaimed land close up to the City which could be bought at a reasonable price if the deal were made under pressure by the Municipality or by the Government.

There is a railway which runs all along that side of the river to the docks, but it is not used for passenger service. If an Air Port were built at the right place this railway could be used for the conveyance of passengers and air-line goods from the aerodrome to the city, a matter of perhaps, four or five or six miles,—according to where the aerodrome might be placed.

The service could be run by motor-rail coaches. And later on possibly a motor-road might be built alongside the railway like the excellent road Mr. Robinson has built out Westward along the Docks past the "Quay of the Disinfections." Both as an engineering proposition and as a commercial proposition, the whole scheme is quite reasonable. British firms have taken many much bigger risks and have made good profits out of them.

Given a proper aerodrome of this kind, overland air services can be maintained with the whole of Europe, and the great overseas air lines, which one has advocated hereinbefore, can be operated with the least possible trouble and expense.

One hopes most sincerely that some of the people with money, who are now interesting themselves in British aviation, will give their serious attention to a proposition which may, and almost certainly will, in the end be of the greatest importance to the whole development of British aviation all over the World.

Seafaring.

Though what follows has little to do directly with Aviation, it may be found of interest to those readers of this paper who are interested in engineering in general, because of its bearing on Aeronautical Engineering. We went to Lisbon in the Royal Mail Steam Packet Co.'s motor vessel *Asturias*. When she was built, in 1926, by Harland and Wolff she was the largest and most powerful motor-vessel in the world, and she is still one of the finest vessels of her size afloat. Her gross tonnage is 22,500, and she has accommodation for 1,800 passengers and crew. Her engines are two sets of eight-cylinder four-cycle double-acting Diesel engines of the Harland B. and W. type, and they develop 20,000 h.p.,—which gives her a speed of about 15 knots.

Before embarking, one was warned by certain knowledgable friends that we should suffer from vibration of the engines and the smell of the crude oil used as fuel. That is one of the objections raised against the use of heavy-oil engines in aircraft.

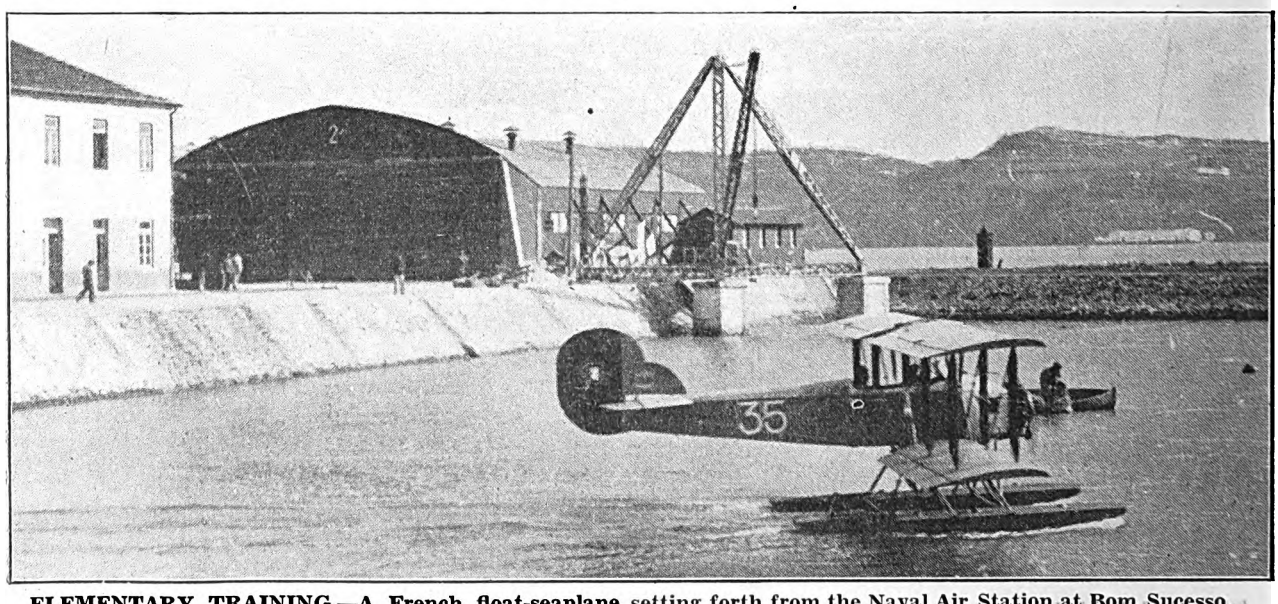
So far as the smell of oil was concerned, it was practically unnoticeable, except at one particular corner of the promenade deck, where a ventilator apparently comes up from the engine-room, and a downward air current from the deck above brings the smell of the oil into some kind of a swirl onto the deck. Walking round the deck for exercise, with varying speeds of wind in relation to the ship, the smell of the oil was always met at that particular corner, and it varied a little fore and aft according to the air-speed. There was material there for the study of air currents.

The vibration was rather another matter. This was quite noticeable, and it was intermittent on a regular period. It was particularly strong when the ship was at anchor at Cherbourg and Coruña and Vigo, where we called. When she was actually going ahead it was much less noticeable.

Thanks to one's beautiful ignorance of the arrangement of Diesel-engined ships, one was under the impression that when once these enormous compression-ignition engines are started they are kept running until the end of the voyage, and when the ship is calling at a port they are just thrown out of gear, as one throws a car engine out of gear, and are left running. And naturally one assumed that the extra vibration when at anchor was caused by the engines running light without any load. This seemed to be the impression of most other people in the ship.

Just before we reached Lisbon, on the fourth day out (it takes four days to reach Lisbon by steam against eight hours by air), one was allowed, by the kindness of heart of Mr. J. T. Eadie, the Chief Engineer, to go and look at the engines. Mr. Eadie himself explained their chief points, and one owes him a deep debt of gratitude for his patience in enlightening one's ignorance. One could have spent a week in the engine-room perfectly happily. But one had to absorb as much information as possible in something less than an hour.

One then discovered that all this vibration about which one had heard so much (and, incidentally, it is nothing like as bad as people made it out to be) was not caused by the big main engines, but by the separate engines which drive the dynamos which supply the current for the re-



ELEMENTARY TRAINING.—A French float-seaplane setting forth from the Naval Air Station at Bom Sucesso.

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frigerators and for the lighting and for all the accessory gear of the ship, such as winches and derricks and pumps and ventilators and air-compressors and fuel-pumps, and so forth,—all of which are electrically operated.

There are four of these engines, each of 800 horse-power, and they are all placed side by side, with their shafts lengthwise of the ship forward of the main engines. That is to say, there is 3,200 horse-power playing round driving dynamos. These engines, just like the engines of multi-engined aircraft, cannot be made to run at exactly the same rate of revolution, so at certain periods they all get onto the same stroke at the same moment. Then you get a synchronised vibration made up of each engine's vibration multiplied by four.

The result is that while they are all out of phase with one another you feel no vibration at all for some minutes. Then you feel a slight vibration, which gradually builds till it becomes quite noticeable as the four engines get into step, and then it dies away again as the engines get out of step with one another. There probably is some way of damping out or killing this vibration, or of stopping it from happening at all. But actually, when one knows what it is, it is not worth bothering about.

A Fine Holiday.

For the benefit of any readers who may be thinking of spending a holiday in Portugal, one can strongly recommend their going by sea. The *Asturias* in particular is a delightful ship. The food is as good as that in any first-class London hotel, and the attendance both in the saloon and in the cabins is excellent. The cabins themselves are very much more comfortable than are the rooms of most decent London hotels.

The only criticism one has to make of the ship is the lack of comfort in the main saloon. Practically there is not, or at any rate there was not then, one single really comfortable armchair or settee in the whole place. They all came into line with the theory which one held until quite recently about all classes of public conveyances, from steamships to 'buses, that the people who design their seating never sit down.

We came back in the *Almeda Star*, belonging to the Blue Star Line. These "Star" ships are curiosities in their way. Up to the water-line, at any rate coming back from South America, they are full of thousands of tons of frozen meat. And on top of the frozen meat there is accommodation for about 120 first-class passengers in what are probably the most luxurious cabins ever built. They carry no second or third-class passengers at all.

Good as was the accommodation in the *Asturias*, the *Almeda Star* is even better, though she is a much smaller ship. Especially in the matter of the seating in the main lounge the Blue Star people have got the R.M.S.P. badly beaten. On the other hand, the food in the *Almeda Star* was not quite as good as in the *Asturias*.

Perhaps the most peculiar thing of all was that, although the ship was carrying tons of fruit from the Canary Islands, or from Madeira, we never struck a piece of ripe fruit all the way from Lisbon to London. Really some of the fruit ought to be put in the engine-room to ripen, instead of being kept in the refrigerators.

Apart from that, the ship was a sheer delight,—with one mechanical exception. Somewhere down in the bowels of the ship there is a pump which at irregular intervals mooes like a cow. And it might be mistaken for a distant fog-horn. As the thing went on night after night in perfectly clear weather one made inquiries, and one found that passengers had continually complained of this particular pump.

Then one learned that it was the product of that excellent firm J. and G. Weir, of Glasgow. If that regular reader of The Aeroplane in the past, the Lord Weir of Eastwood, or his brother, Air-Commodore J. G. Weir, who one hopes is still a regular reader of this paper, should come across these notes, one hopes that they, separately and severally, will cause inquiry to be made into the design of that particular form of pump, with the idea of having its vociferousness somewhat decreased in the future.

Finally, one would like to put on record the fact that one found the shipping people, that is to say, the people operating the ships, quite keenly interested in flying. They all seemed to regard, as a natural consequence, the shooting of mail-carrying aeroplanes from ships, and the delivery of mail from aeroplanes to ships out at sea.

And, unless some alteration happens to the marine mind, one can see passengers also being delivered by air from ships, but in another sense, namely that travelling by air will in due course take all passenger traffic away from the shipping lines if they do not wake up.

Although both the *Asturias* and the *Almeda Star* are run with the most beautiful efficiency at sea, as soon as they get to their port that utter indifference of the Marine Mind to time and space becomes evident again. Because of fog we had to crawl from Boulogne to the coast, and because of intense traffic, we had to creep slowly up the river to Tilbury. But the process of debarking at Tilbury was heart-breaking.

Our baggage had been carefully arranged in alphabetical order on deck for the Customs people. After that it ought to have been put into crates and shot straight overside into the tender and from the tender to the dock and from the dock into the train, and then it would still have been in alphabetical order at King's Cross. Instead of that, each individual piece was man-handled along the deck, then it was man-handled again down a chute into the tender, and then man-handled again from the tender to the dock and from the dock to the train. So at King's Cross it all had to be re-sorted again.

As an example of inefficiency and ignorance of organisation it was a quite perfect exhibition. And it wasted an hour or more. Still one will forgive the Marine Mind all that for the sake of the comfort and pleasure of two delightful voyages of four days each at the low price of £10 each way.

Good Advice.

By way of reciprocation, one offers, free of charge, to all the great shipping companies which run to South America the advice that they get together and form an air-mail combine. Quick transport of mails and shipping documents to South America means quicker business and more business for British firms. And more business for British firms means more transport and more profit for the shipping lines.

The ancestors of those who are running those lines took a gamble on iron ships, and on steam, and on oil fuel, and more lately on Diesel engines. Let us see whether the men of to-day have the pluck to take a gamble on air transport as a way of increasing their own fortunes.—C. G. G.

ADVANCED TRAINING.—A group of Portuguese Army Officers at Alverca, with an antique Bréguet.

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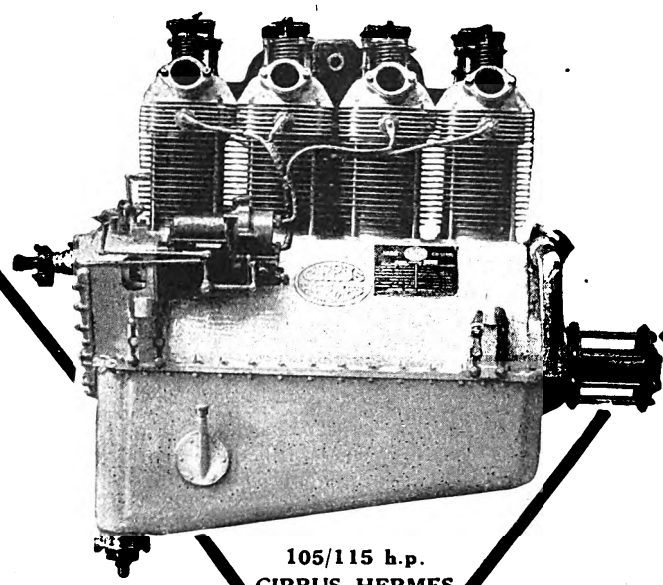
NOTABLE HERMES FLIGHTS



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THE "GRAF ZEPPELIN"'S VISIT.

DR. ECKENER IN ENGLAND.

Dr. Hugo Eckener, the head of the great German Zeppelin Company and Technical Director of the Goodyear-Zeppelin Co., in the United States, arrived in England on Apr. 23 by steamship from America and during his short stay was the guest of the Royal Aeronautical Society.

On Apr. 24 he was received by His Royal Highness the Duke of York, in his capacity as Patron of the Royal Aeronautical Society, at his residence at 145, Piccadilly. Dr. Eckener was accompanied by Colonel the Master of Sempill. Dr. Eckener had the honour of giving His Royal Highness an account of the *Graf Zeppelin's* recent World cruise, in which he commanded the ship.

Later in the day Dr. Eckener was received by the Lord Mayor at the Mansion House and in the evening he broadcast a short address on the *Graf Zeppelin*. He was entertained to dinner by Colonel Sempill and several of the airship specialists in this country.

On Apr. 25 one had the pleasure of a short interview with Dr. Eckener, in which, incidentally, he was very complimentary to THE AEROPLANE.

Dr. Eckener said that the greatest of all problems now to be solved by designers, constructors and operators of airships was the handling of airships on or near the ground. He said that the mobile stub-mast which has been used successfully by the U.S. Naval airship people at Lakehurst, seems to be very promising, but he does not regard it as the final solution of the problem.

He said that the Zeppelin Company themselves at Friedrichshafen had hitherto paid practically no attention to the problems of ground handling because they had directed all their energies and intelligence towards proving and improving the airworthiness of their ships. With his usual logic Dr. Eckener said that there was no good bothering about handling an airship on the ground until they had proved that it was a commercial proposition for air transport. Now, he said, they had proved that instead of the airship being the plaything of storms the airship could itself play with storms, either by going round them or over them or, under certain circumstances, through them.

Having proved the capabilities of the ships they were now investigating the ground problems. The chief of these was the question of the best way of making the tail of the ship follow the nose when being towed into a shed by the mobile stub-mast. Some of the airship people in America seemed to think that the best way was to have the tail of the ship about 1,000 lbs. heavy, resting on a truck which would follow the movements of the stub-mast.

This, he said, presented two possibilities of trouble. One was that if the mast towed the ship and the truck under the tail it would put severe strains on the framework of the ship. On the other hand, if the truck was itself an automobile, there would be still further possibilities of damage through mistakes in the driving of the tail-truck.

On the other hand, if the tail had no support when following the mast there would be the possibility of its bumping on the ground, and if it were anchored to an automobile truck but left light so that it had a tendency to lift from the truck, there was still a possibility of damaging it.

Also there were various questions of the best way of getting a big ship into and out of sheds in a side-wind,—to avoid even minor damage such as that which was done to R.100 at Cardington the other day.

Various experiments were being tried in the States, he said, and presumably would be tried in Germany, in controlling ships into sheds by means of guy-ropes attached to automobiles on the windward side. Dr. Eckener made the interesting statement, which is obviously true when one comes to think of it, that the bigger the ship the easier it is to handle on the ground because it is less affected by ordinary variations in gusts of wind.

Another of the problems which Dr. Eckener has been investigating is the best placing of airship stations. He said that they have practically no trouble about wind at Friedrichshafen because the wind is always either up or down the Lake. From the South they are protected by the Alps from strong winds and from the North they are protected by tree-clad hills. He remarked that trees were the best protection against strong winds because they slow the surface wind down better than anything else.

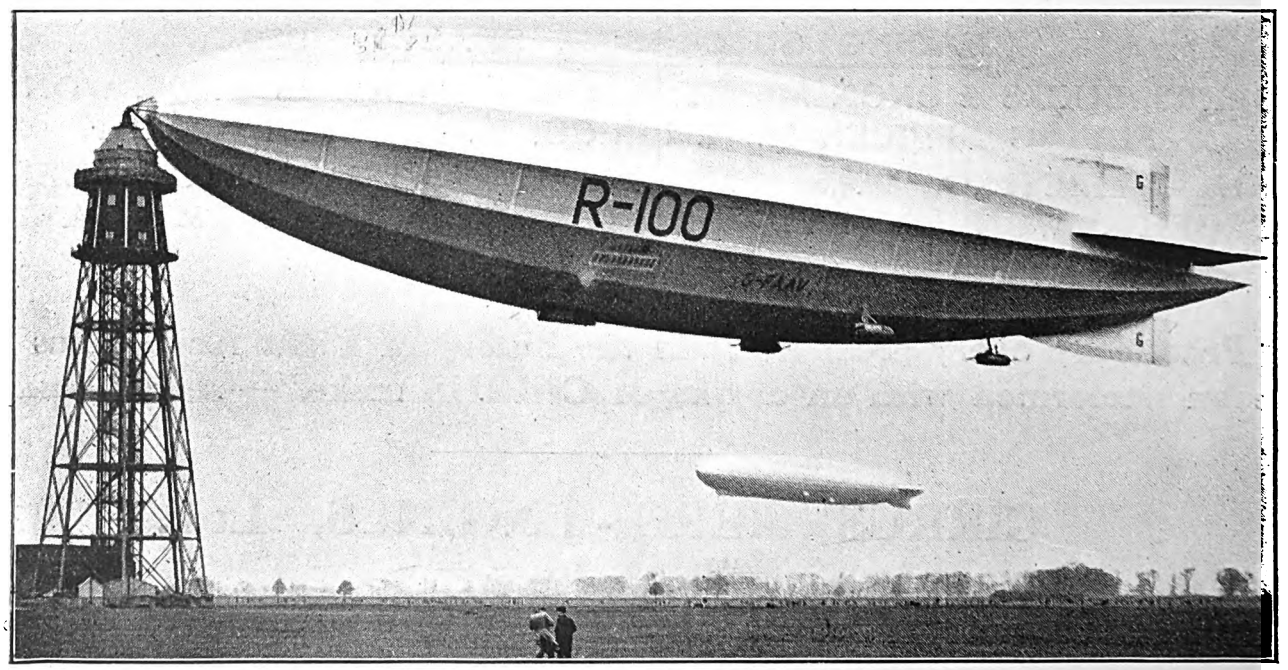
He said that he had investigated several good places in America where an airship station could be built in a kind of bowl surrounded by tree-clad hills with gentle slopes so that there would never be a really strong wind on the ground and there would be no actual down-currents,—such as are caused by cliffs or very steep hill-sides.

Dr. Eckener expressed his satisfaction with the progress which is being made by the Goodyear Zeppelin Co. in the States with the two 6,500,000 cubic foot ships which are now being built. He said that several of the rings and girders are already in position and that they hoped to have the ships out about the middle of next year.

The size of these ships may be gauged from the fact that our two ships are of 5,000,000 cubic feet.

Concerning his visit to the States and to England Dr. Eckener remarked humorously that he had come to the conclusion that when a man attained to a certain amount of success and publicity what he needed most was a strong stomach rather than a good head. Certainly one can compliment him on the possession of both, for considering the amount of banqueting and lunching that he has had Dr. Eckener looks amazingly well,—and a good ten years younger than his age. And so far as his head is concerned, the immense success which the Zeppelin Company has achieved through his combined ability as an engineer and as a diplomatist and as a business man is quite enough evidence.

So, after compliments, one left Dr. Eckener with the prospects before him of lunching at the German Embassy and dining with Lord Thomson.—C. G. G.



DOG-IN-THE-MANGER.—Our Capitalist Airship, which came out of its kennel in such a hurry to grab our only mooring-mast before the Zeppelin arrived that it caught its tail in the door. The "Graf Zeppelin" is seen approaching.—(*"Aeroplane" photograph.*)

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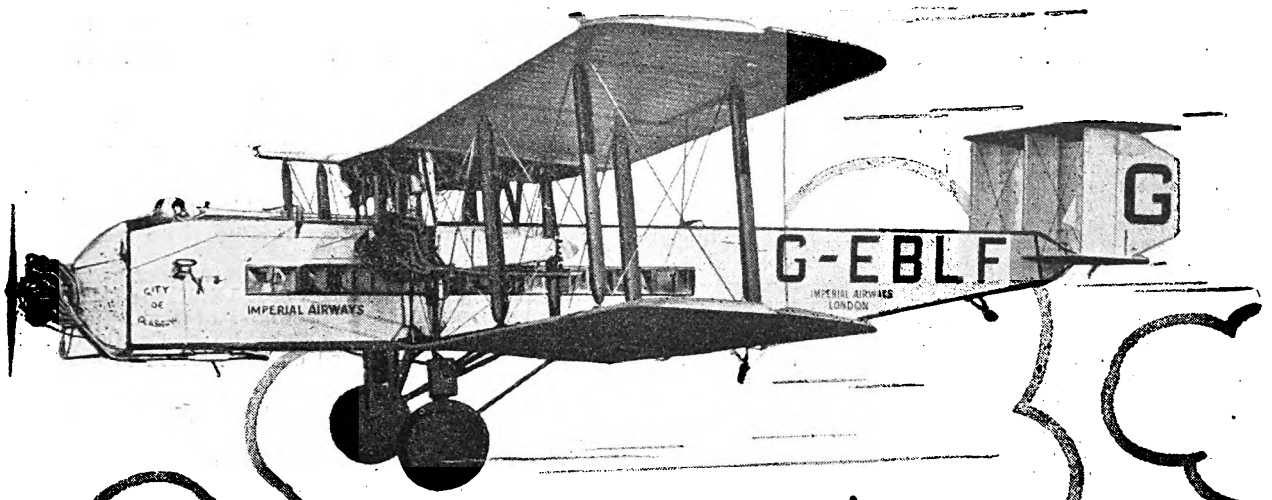

OVER 1,000,000 MILES

IN just over 4 years seven Argosies in the European Fleet of Imperial Airways Limited have flown 1,023,075 miles in approximately 11,296 hours. They have carried over 80,000 passengers; they have crossed the Channel approximately 4,200 times.

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At the dinner given in his honour at the Athenæum by Col. the Master of Sempill, President of the Royal Aeronautical Society, Dr. Eckener spoke at some length on the future development of the airship. He gave a vivid description of the difficulties and uncertainties of his first trip round the World.

He said that much of the country over Siberia and China is for all practical purposes uncharted. He was compelled to rely on guide books and uncertain maps with the result that mountain ranges which were stated to be 1,000 to 1,500 metres high were found to be some 2,000 metres. The heavily loaded condition of the *Graf Zeppelin* did not allow her to rise above 1,500-1,800 metres over the European and Asiatic part of the route, and ultimately she crossed through a pass at 1,800 metres, the peaks on each side towering 300-400 metres above the ship.

One of the very remarkable points in Dr. Eckener's address was his description of the way he decided to make use of a tornado which was moving Eastwards. He first heard of the tornado when crossing Asia. Till then the airship had been using only four engines, but five were brought into use and Dr. Eckener ordered full speed ahead to catch up the typhoon. Behind it, as he explained, there would be a favourable wind. As a result of keeping in touch with the typhoon the *Graf Zeppelin* crossed the Pacific to San Francisco at a record speed. As he vividly put the problem "Typhoons are not comfortable things but we don't let them play with us. We play with them!"

Dr. Eckener divided the problems which had got to be solved to place airships on a firm commercial basis into three.

The first was the necessity for the use of helium. With an experienced crew there was not the slighest danger from the use of hydrogen, but the time was rapidly coming when there would be many airships, and the crews would not have the necessary experience to ensure that complete regard for safety which was so necessary. Practically all the helium supplies came from the United States, but he thought as a result of his recent visit there that the problem of an ample supply of the gas would be solved. He had no doubt, indeed, that all future airships would be using helium and not hydrogen. Airships were an international problem and the whole organisation of airship traffic must be based on that conception.

The second problem was that of suitable airports. These must be chosen not only for the general suitability of their positions for traffic, but so that there was a prevailing wind during most of the year, so that these ships could be taken into their hangars without the difficulty to be faced of a cross wind. He appreciated the experiments which were being made with mooring masts, but he still believed that the suitable choice of airports was vital.

The third problem was the mechanisation of handling airships on the ground.

He saw no possibility in the near future of trans-oceanic traffic for heavier-than-air craft, but every possibility for the airship.

There were present at the dinner:—Col. the Master of Sempill, H.E. the German Ambassador, Herr Dieckhoff, Admiral of the Fleet Sir Charles Madden, Air Vice-Marshal Sir Sefton Brancker, Sir Godfrey Thomas, Rear-Admiral Basil Brooke, Lt.-Col. V. C. Richmond, Wing Cmdr. T. R. Cave-Browne-Cave, Flt. Lt. Nixon, Mr. B. N. Wallis, Lt.-Col. M. O'Gorman, Dr. Gerald Merton, Lt.-Col. N. G. Thwaites, Mr. G. H. Thompson, Mr. David Boyle, Capt. J. Laurence Pritchard.

The Lord Thomson, Secretary of State for Air, gave a private dinner at the Ritz Hotel on Apr. 25 to Dr. Eckener. The following guests were also present:—

Mr. F. Montague, M.P., Under-Secretary for Air; Air Chief Marshal Sir John Salmond, Chief of the Air Staff; Air Marshal Sir John Higgins, Air Member for Supply and Research; Air Vice-Marshal T. I. Webb-Bowen, Air Member for Personnel; Commander Sir Dennistoun Burney; Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation; Wing Commander R. B. B. Colmore, Director of Airship Development; Lieut.-Col. V. C. Richmond, Assistant Director for Airship Design; Lieut.-Col. M. O'Gorman; Col. The Master of Sempill; Flt. Lt. S. Nixon, Assistant Director of Airship Organisation; and Mr. C. Ll. Bullock, Principal Private Secretary to the Secretary of State for Air.

The Landing of the "Graf Zeppelin."

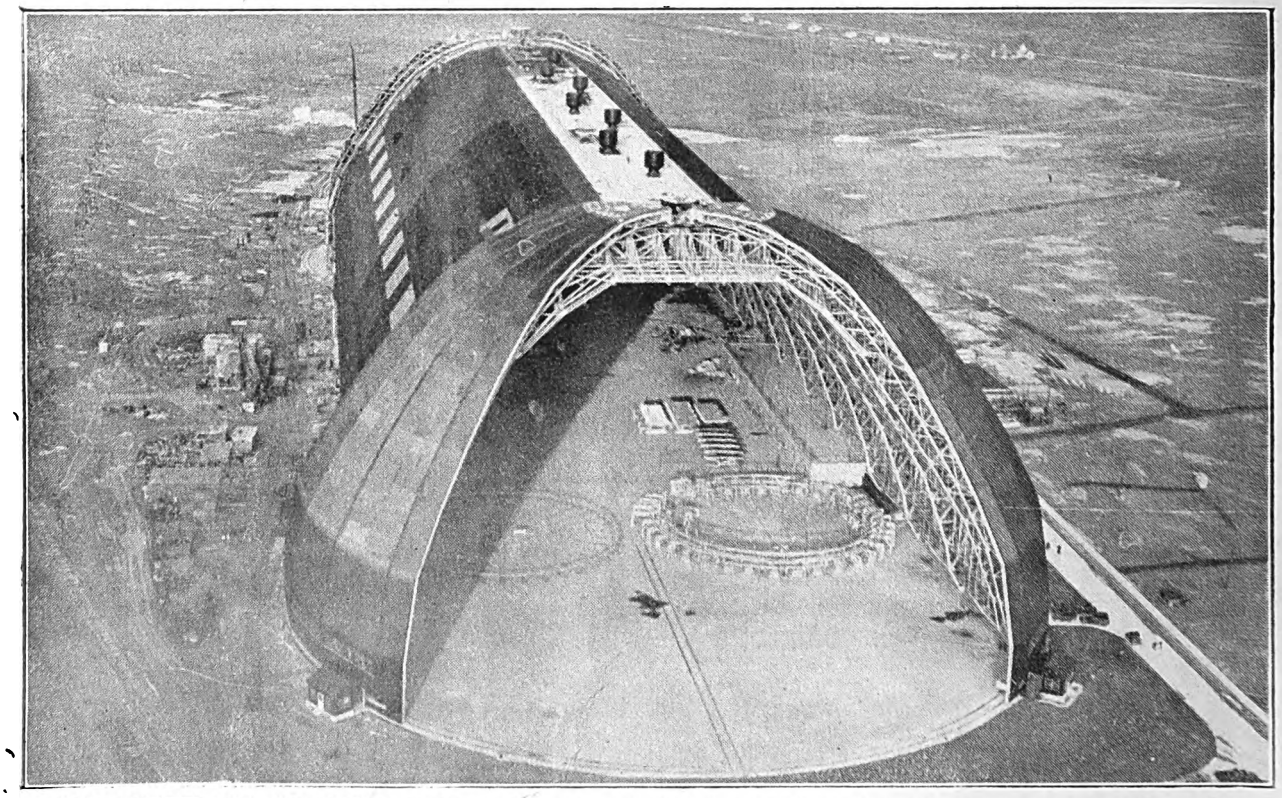
The landing and departure of D-LZ127, the *Graf Zeppelin*, was an eyeopener to those who had seen the slow and laborious mooring of R.100 and R.101 at Cardington. From the time the ship appeared on the horizon to the lowering of the steps for the passengers to alight was only a quarter of an hour. And ten minutes sufficed from the raising of the steps to the disappearance of the airship in the distance. In sight for one hour. On the ground with the gangway lowered thirty-five minutes!

On April 26 at 17.00 hours the ship came into sight at about 700 ft. probably because of low clouds and rain showers. She made a wide sweep round the South and East of the ground, descending to about fifty feet as she crossed the railway line and approached the lee of the Airship Sheds. About 300 yards from the landing point the wing engines were reversed full speed astern, and the central engine aft was kept running forward to keep a slipstream on the control surfaces. This brought the ship to rest in her own length and at the same time she came down to about twenty feet, probably because of reduced dynamic lift.

When stationary three handling lines were lowered from the nose, a number of men seized the hand-rails of the control-car and aft gondola, and the *Graf Zeppelin* made an absolutely perfect landing. It was so quick, smooth and certain as to be almost unbelievable.

The appearance of the *Graf Zeppelin* is well known to readers of The Aeroplane. She is 48 ft. longer than R 101 but, being 31 ft. smaller in diameter, has 1,300,000 cub. ft. less capacity. The general impression is, however, that the *Graf Zeppelin* looks larger than the 5,000,000 cub. ft. British ships. She also appears to be faster and easier to manœuvre.

The entrance to the control cabin and passenger compartment is on the starboard side. Folding steps and hand-rails are carried. The navigating cabins and galley are forward of the entrance, the passenger accommodation is aft, and, judging from external appearance, somewhat cramped.



THE ZEPPELINS' AMERICAN HOME.—The great shed of the Goodyear-Zeppelin Corporation at Akron, Ohio. The first rings of the two new Zeppelins may be seen an the floor, although the other end of the shed was not yet finished.

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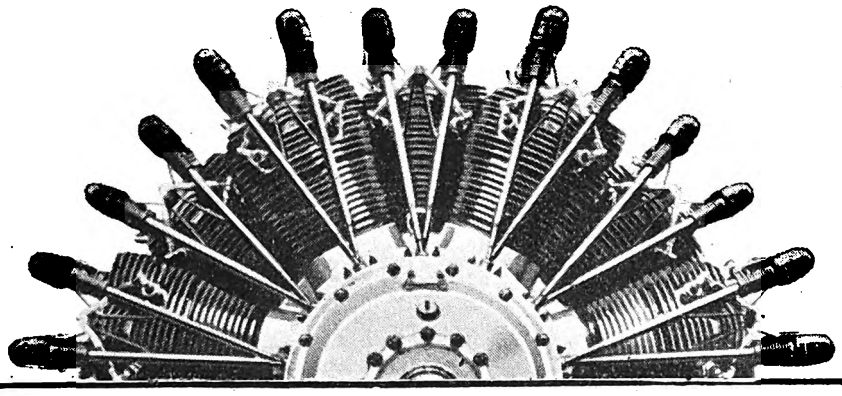
The

World-Wide Dominance

of

ARMSTRONG SIDDELEY AERO ENGINES

is shown by the following list of countries where they are in use:



AUSTRALIA uses Genet, Genet Major, Mongoose, Lynx, Jaguar.
NEW ZEALAND uses Jaguar.
CANADA uses Genet, Genet Major, Lynx, Mongoose, Jaguar.
SOUTH AFRICA uses Genet, Genet Major, Lynx, Jaguar.
INDIA uses Jaguar, Genet Major.
IRELAND uses Genet.
EGYPT uses Jaguar, Genet Major.
FRANCE uses Genet, Genet Major, Lynx.
GERMANY uses Genet, Lynx, Jaguar.
BELGIUM uses Lynx.
SPAIN uses Lynx.
HOLLAND uses Mongoose, Lynx, Jaguar.
SWEDEN uses Mongoose, Lynx, Jaguar, Leopard.
AMERICA uses Genet, Genet Major, Jaguar.
ARGENTINE uses Mongoose.
BRAZIL uses Lynx.
CHILE uses Lynx.
ESTHONIA uses Genet Major, Lynx.
LATVIA uses Lynx, Jaguar.
JAPAN uses Mongoose, Lynx, Jaguar, Leopard.
DUTCH EAST INDIES uses Lynx.
IRAQ uses Jaguar.
MALTA uses Jaguar.
DENMARK uses Lynx, Jaguar.
ITALY uses Lynx.
RUSSIA uses Jaguar.
POLAND uses Genet.
GREECE uses Lynx, Jaguar.
SWITZERLAND uses Lynx.
ROUMANIA uses Jaguar.
SIAM uses Lynx.
SINGAPORE uses Genet Major.

ARMSTRONG SIDDELEY MOTORS LIMITED, COVENTRY, ENGLAND,
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KNOWN AND FLOWN ALL OVER THE WORLD.

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There is a hatchway behind the passenger compartment, just below the electric light generator, which gives access to the crew's quarters.

This electric light engine is a six-cylinder engine of apparently about 20 h.p. and presumably runs on hydrogen fuel. It appeared to be very noisy and possibly causes the passengers some discomfort.

The engine cars appear to be of normal type with ladders for access while in the air. They are fairly close to the hull and some pulsation of the fabric is noticeable.

There is a "dew-drop" in the nose of the ship, but I was given to understand that the ship is not strong enough to ride out a gale of wind when moored to a mast. There is no provision for disembarking at a mooring mast.

The spectacle of the first voluntary landing of a Zeppelin in England was a great draw, and the spectators numbered many thousands, in spite of the rival claims of the Cup Final at Wembley. All the car parks were overflowing, and the roadsides were full of cars parked, with resulting congestion of the narrow road, for two or three miles.

Just as the airship came to rest the spectators broke through the few police in charge of the ground and rushed across to the ship. But ropes were available and the crowd was kept in check a few yards on either side of her.

The passengers were landed and met with the usual examination by the Customs officials. Rain was falling slightly, and the luggage had to be put on the wet grass. But it was not so bad as Dover Pier on a wet day.

The departure was as simple as the landing, the ropes were released and the engines started, all except the upper starboard engine, which had to be pulled over compression by a gallant fellow who stood out on the tail of the crankcase and worked the propeller over with one hand, while holding on by the other.

The ship disappeared quickly over the hills to the South, and there was not the usual (to us) dodging of water ballast. The method of obtaining this clean get-away was interesting to watch.

Soon after landing, when the handling-crew were all arranged holding the rail, water ballast was discharged quietly for some minutes from just aft of the middle of the ship. This of course made the ship light and ready to rise. She rose about a hundred feet, the engines were opened out, and she continued to rise by dynamic lift as she gathered speed.

The whole performance was as quick as the landing of passengers from a ferry-boat, a very great contrast to the slow laborious method of mooring one of our airships at the mast, which always takes considerably over half an hour with three hawsers and steam winches, and makes one ask whether it is not better to have experience than much complicated machinery.

The complicated and costly machinery or elliptical airship-boats suggested by Sir D. Burney in his book "The World, the Air and the Future" seem unnecessarily slow and awkward when a real airship appears, lands, waits half an hour and departs, in an hour from the time it is first seen to when it disappears again, and poor R.100 rides at the mast nearbye with a broken tail.—L. HOWARD FLANDERS.

[At the same time in justice to our own ships, we must note that the Zeppelin landed in a perfectly equable temperature and a dead steady wind. There were no heat-bumps to make her surge and no gusts to drive her back and forth. In the sort of wind in which mooring-masts are useful the Zeppelin could not have been man-handled at all on such open country.—ED.]

THE HOMEWARD VOYAGE.

When the *Graf Zeppelin* left Cardington she carried as passengers Colonel the Master of Sempill and Mrs. Sempill; Air Commodore and Mrs. J. G. Weir; Dr. and Frau Solmssen; Miss Carstairs; Miss Jenkins; Sir Sefton Brancker; Wing Commander E. L. Gossage, British Air Attaché in Berlin; Commander H. Campbell, Equerry to the Duke of York; Mr. David Boyle, of the Cunard Company; Mr. Campbell Begg, a well-known New Zealand surgeon; Lieut.-Colonel V. C. Richmond, designer of the R.101; Sq. Ldr. Rope; Mr. Herman Volk; and four Germans who had come over in the ship. Four members of the crew were left behind at Cardington, partly to make room for passengers and partly because they wanted a holiday in London. Besides these twenty passengers the Zeppelin carried a crew of forty-five.

Mr. Herman Volk, who incidentally is a pioneer of British Aviation, and built some of our biggest flying-boats, called on THE AEROPLANE on Tuesday morning and gave us a brief description of the voyage.

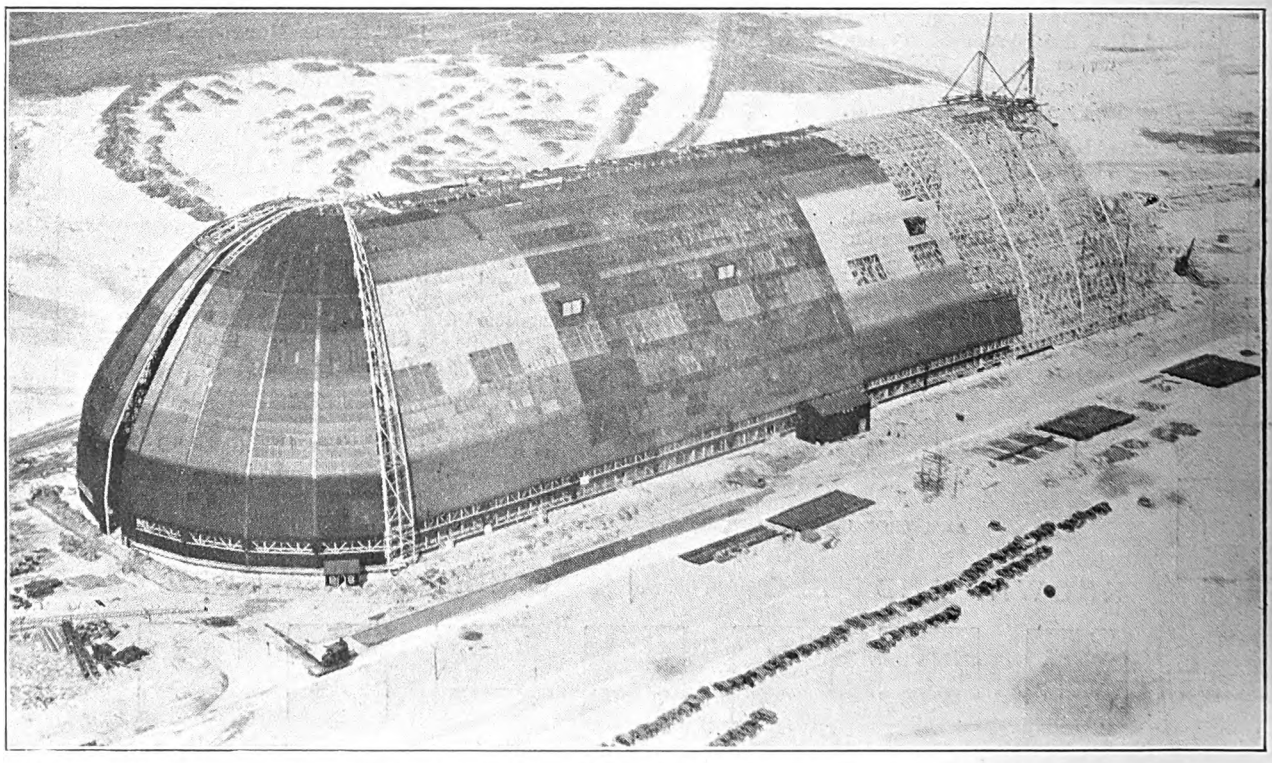
After leaving Cardington in the rain the ship ran into fine weather and cruised over London at a height of a few hundred feet. Thence she followed the Thames and the north coast of Kent to the North Foreland and thence crossed the Channel to Ostende, arriving over Brussels just about dark.

The passengers were given a dinner on board the ship which would have been a credit to any first-class restaurant, and the wines, very properly, were of peculiar excellence. Captain Eckener presided at one table and Captain Lehmann at the other, exactly as in an ocean liner.

The two-berth cabins in the ship are as comfortable as those in any liner and the lavatories are equipped with constant hot water. As the cabins are outside the hull the windows can be opened, and one has none of that overcoming feeling of being trapped and confined that one has in both our airships.

Everybody got up at dawn, to find themselves near the head of the Rhine. They were then taken for a trip along Lake Constance and back over the Austrian and Swiss Alps, dodging along passes with the higher peaks far above them. All this was in bright sunny weather and was an experience not to be forgotten. They arrived at Friedrichshafen at 06.45 hrs.

The landing was an exhibition of perfect organisation.



AT AKRON.—The new Zeppelin Shed, with its curious pivotting doors, in process of building. The number of cars parked in front is interesting. The mounds at the other side do not represent the graves of workmen killed through falling off the shed, in spite of the cost of American hustle.

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The regular landing-place is in a kind of bowl and is so small that, as Col. Sempill said, one would hardly care to put a Moth down there. As the ship approached the ground groups of men converged towards it from the sides of the aerodrome. At a given height handling ropes were dropped, with hardly a metre to spare. The groups of men opened out, and disclosed the fact that each group carried a pulley to which was attached five or six lines. The men holding these lines spread themselves out fan-wise, others of the group picked up the handling line and rove it through the pulley and so the group with the pulley became a kind of mobile anchorage against which the men holding the other line were able to haul the ship down, instead of having to valve out gas.

When the various handling lines were secured the ship was walked towards the shed and at the entrance to the shed the pulleys were attached to small cars running on rails. These were then pushed into the shed and the ship was berthed with no more trouble than running a train alongside a platform.

The officers saluted and the passengers went ashore. A few minutes afterwards the officers, in plain clothes, came out with their suitcases, joined their wives or other relatives who were waiting for them with cars outside, and drove away with no more fuss than any ordinary ship's officer going off duty.

The passengers were taken to the Friedrichshafen hotel, where they had breakfast. Then the men of the party were taken across the Lake to the Dornier Works by motor-boat, where they saw two new DoXs being built and a number of Dornier Wals being transformed from passenger craft into war machines for the Soviet Government by fitting gun-rings and bomb-gear.

On returning to Friedrichshafen the party were taken in Maybach 100 h.p saloon cars of the most luxurious type for a trip through the Black Forest. In the evening they were entertained to dinner by Dr. Eckener. On Monday morning they were driven to Baden-Baden by their kindly hosts and there joined the Mittel-Europa Express for the Hook of Holland, whence they arrived in London on Tuesday morning.

The Wembley Incident.

The flying of the *Graf Zeppelin* over the Wembley Stadium during the Association Cup Final on Saturday was a regrettable incident, caused by a misunderstanding for which nobody was particularly responsible. Naturally our good friends in the Zeppelin had no idea that they were about to fly over the Stadium while the game was actually in progress.

Despite the importance which is attached to Association Football by certain sections of the populace in this country, the German papers do not publish the exact hours of the more important Association matches in this country. Consequently, Captain Lehmann and his crew had no idea whether they were going over the Stadium before the match or at half-time, or after the match. Their sole desire was to demonstrate the handiness of airships to a vast concourse of people. And they certainly did all that.

The mistake really arose because those people in this country who had arranged the programme of the Zeppelin had no idea that the ship would be demonstrated at such close quarters. And quite possibly they do not realise that Association Football is not a game but a cross between a religion and a trade,—with neither of which institutions one may lightly interfere in this country.

They expected the Zeppelin to cruise round at a height of probably 2,000 feet and not to cross the stands at 20 feet. That was all.—C. G. G.

THE R.100.

While the R.100 was being walked out of her shed at Cardington on Apr. 24 a sudden change of wind caused the outside edge of the starboard elevator to scrape against the side of the shed. The ship was taken to the mast and moored, presumably because doing so was less dangerous than trying to put her back into the shed.

After repairs have been made R.100 will make some trial flights of 12 hours' duration before preparing her for a flight to Canada and back in May.

No passengers will be carried on the outward journey to Canada as the prevailing winds will be contrary, but possibly a few passengers may be carried on the return flight when favourable winds and a more direct route will reduce the weight of fuel necessary.

Post Office engineers are laying a land line between Cardington and the wireless station at Rugby for direct communication, particularly for the transmission of weather maps, between Cardington and the airship during her Canadian flight.

MOORING MASTS.

In the House of Commons on Apr. 16, in reply to a question by Mr. Louis Smith, the Under-Secretary of State for Air said that four mooring masts had been erected for the express purpose of mooring R.100 and R.101. They were situated, respectively, in this country at Cardington; in Egypt on the Suez Canal, 2½ miles from Ismailia; in India, 10 miles from Karachi; and in Canada, at St. Hubert, four miles from Montreal. No further masts were being constructed in Canada.

THE AIRSHIPS.

In the House of Commons on April 9, Sir G. Penny asked the Under-Secretary of State for Air whether any useful data had been obtained from the flights of the R.100 and the R.101: and to what purpose these vessels would now be put.

Mr. Montague circulated the following reply:—

The answer to the first part of the question is in the affirmative. It is difficult within the space of a Parliamentary answer to enumerate the data established by the flights. Some information upon this subject, as well as upon that referred to in the second part of the question, regarding the future use of the airships, was given in my Noble Friend's Memorandum accompanying the Air Estimates, pages 6 and 7, as well as in my remarks upon this subject during the introduction of the Air Estimates on Mar. 18. To what was then said I need only add that the two airships, essentially experimental in their nature, were built with a primary regard for safety and in conformity with a stringent set of airworthiness requirements. In this respect the design has fully come up to all expectations, and both airships have attained or exceeded the performance predicted for them on the basis of model experiments. The preliminary trials are now complete, and both airships have shown themselves to be thoroughly stable and easy to control. The experience has taught us how to design a safe airship, and we have also learned that it is possible to achieve a reasonable degree of passenger comfort without undue cost in weight.

FRESH FLEET FUNCTIONS.

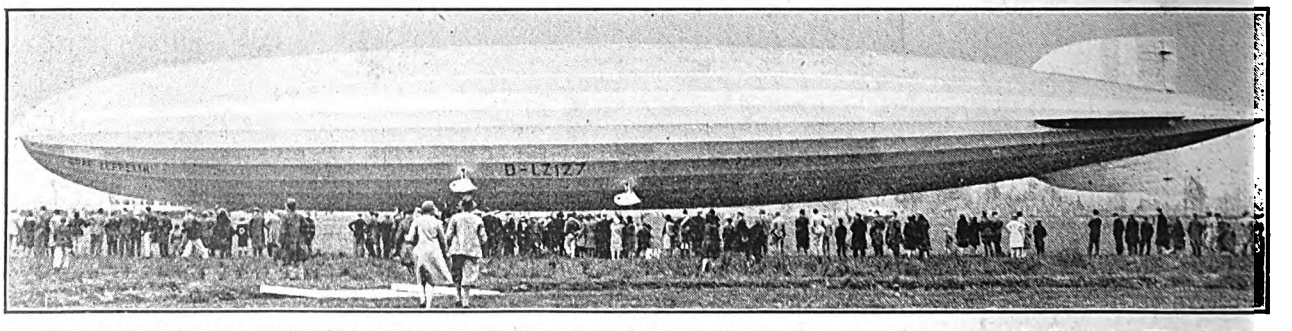
According to what ought to be a good authority, our Aircraft Carriers have now been fitted with machinery which drives them impartially backwards or forwards. The advantage of this feature is that the take-off of sluggardly aircraft may be expedited by reversing the main ship engines all of a sudden, thus leaving the aircraft suspended on their slots in mid-air with no alternative other than to cleave the air without Naval support.

Similarly, aircraft may be sent off from either end of the deck. And, with the advent, in the not so far distant future, of the aeroplane which will fly backwards or forwards, the Fleet Air Arm will be in a position to confuse and confound the most lawless of navigators of sea and sky.

The expression "blunt end," which was once the infallible explanation of the ways of ships, is now no longer used in the best Fleet Air Arm circles. The two sharp ends of our latest Aircraft Carriers, as illustrated by the aforesaid authority, are most confusing.

TWENTY YEARS AFTER

April 28 was the Twentieth Anniversary of M. Louis Paulhan's flight from London to Manchester by which he won *The Daily Mail's* £10,000 prize. The feat then was worth an enormous prize, to-day private owners tour Europe in their own machines, and any business man can charter an air-taxi to fly him between London and Manchester or any other places that circumstances dictate.



PEACEFUL PENETRATION.—The "Graf Zeppelin" just on the point of doing one of Captain Fleming's wonderful "pancake" landings.

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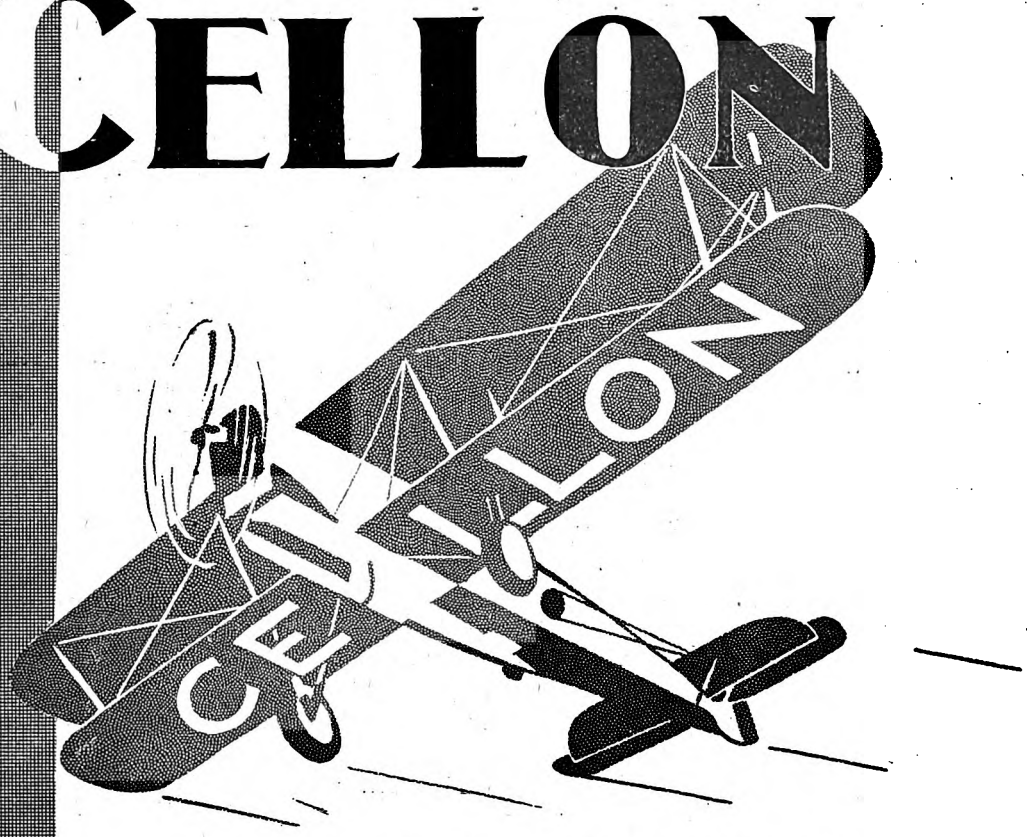
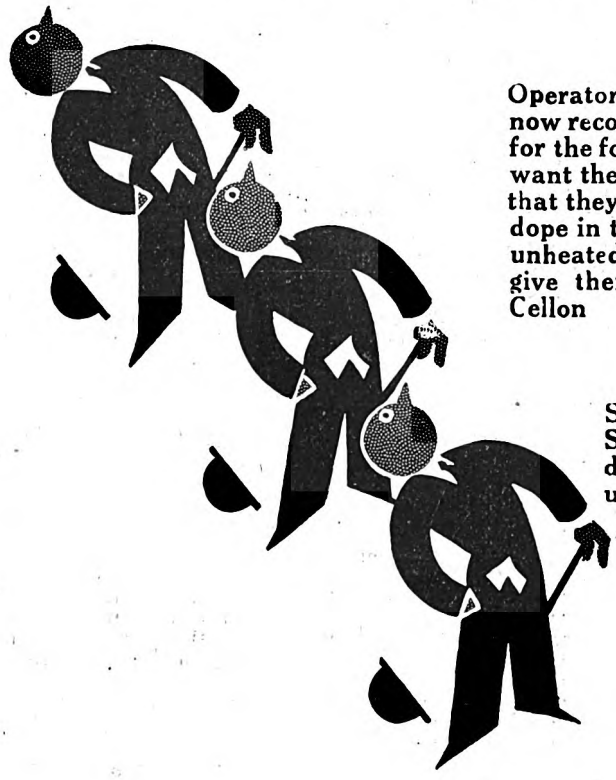
CELLON



THE DOPE OF PROVED EFFICIENCY



Operators and private owners are now reconditioning their machines for the forthcoming season. They want the best protection for fabric that they can get. Whether you dope in the open-air dope shop or unheated factory room, you will give them the best, if you use Cellon

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THE AIR LEAGUE'S COMING-OF-AGE.

The Air League of the British Empire will celebrate its coming-of-age by giving a dinner and dance at the May Fair Hotel, Berkeley Street, W.1, on May 7, at 7.15 for 7.45 p.m.

The Chair will be taken by Sir Alan Anderson, Vice-President of the League.

The speakers will include Sir Samuel Hoare, Sq. Ldr. the Hon. F. E. Guest, Lt.-Col. J. T. C. Moore-Brabazon, and Mr. P. J. H. Hannon, M.P. The Hon. Lady Bailey will receive the guests.

The Committee hope that the Duchess of Bedford and her pilots will also be present.

Application for tickets (30s. dinner and dance or £1 dinner only) should be made to the Dinner-Dance Committee, Air League, Astor House, Aldwych, W.C.2 (Chancery 7258).

THE BANQUET TO LORD AND LADY WAKEFIELD.

The Royal Aeronautical Society, the Royal Aero Club, the Air League of the British Empire, and the Society of British Aircraft Constructors will give a Banquet followed by a Dance in honour of Lord and Lady Wakefield of Hythe at the Savoy Hotel, London, W.C.2, on Thursday, May 15, at 19.30 hrs. for 20.00 hrs.

Brig.-Gen. the Duke of Atholl, K.T., G.C.V.O., D.S.O., President of the Royal Aero Club, will preside.

Those who intend to go to this banquet and did not apply for tickets to the Royal Aero Club, 3, Clifford Street, W.1, when the first announcement of this function appeared in The Aeroplane last week, are reminded that only a fortnight remains before the date and that early application for tickets is essential.

Members are reminded that they may be accompanied by guests.

THE KING'S CUP RACE.

The Royal Aero Club has issued a first schedule of supplementary regulations to govern the race for the King's Cup on July 5. The starting time is not yet announced but the race will start and end at Hanworth. The organisation is in charge of the Royal Aero Club and will be under the regulations of the F.A.I.

As usual the entries must be all-British (both pilot and aeroplane) and the entrant must be an individual and not a company.

A new regulation is included which should have an important effect towards keeping the race on the footing originally intended; and that excludes any but bona-fide civil aircraft. In other words the competing aeroplanes must have been designed and constructed for civil purposes, and ex-war machines will, in consequence, no longer be eligible.

The entry fee is £5 for entries received not later than 17.00 hours on Friday, June 6, but late entries may be accepted up until noon on the following Friday for an entrance fee of £10. The entrant is responsible for the accuracy of all particulars supplied by him to the Aero Club relating to his aircraft and engine.

The Certificate of Airworthiness must be produced at least one week before the date of the race, and the regulations also state that the aircraft must have an engine which is classified as belonging to the normal category of engines, which means, presumably, a production model not unduly altered for racing.

Subject to any concession which the Air Ministry may make for the race all the usual Air Navigation Regulations will be observed.

The course is about 750 miles, and consists of the following stages:—

	Miles.
London (Hanworth Park)	Start
Hamble (Turning point)	56½
Bristol (Control)	66½
Castle Bromwich (Turning point)	83½
Hooton Park (Turning point)	72¾
Manchester (Control)	25½
Woodford (Turning point)	13¾
Sherburn (Turning point)	49½
Newcastle (Control)	91¾
Hull (Control)	109
Leicester (Turning point)	91¾
Hanworth Park (Finish)	89½
Total	749½

Aircraft will, as usual, be handicapped for the complete circuit according to estimated performances, with a minimum speed for handicap purposes of 80 m.p.h. The last restriction is a new one, and will eliminate machines of less than practical cross-country powers. Considering that the race will be flown at full throttle 80 m.p.h. is quite low enough.

The first prize will be, of course, the King's Cup, and a second prize of £500 has been provided by the Rt. Hon. Lord Wakefield of Hythe.

A special cash prize will be given to the aircraft giving the best performance during the race as calculated according to the formula

$$V = K \sqrt[4]{\frac{B.H.P.}{S^2}}$$

V is the handicapped speed in m.p.h. and K a constant of 290. B.H.P. is the horsepower at maximum permissible r.p.m. of the "Type" engine. S is the "equivalent wing span" of the aircraft in feet. The equivalent wing span of biplanes is 1.265 times the span, and for sesquiplanes it is found by adding the greater span to .265 times the square of the lesser.

THE RETURN OF "THE SPIDER."

On the evening of Apr. 21 Her Grace the Duchess of Bedford together with Mr. C. D. Barnard and Mr. Robert Little, in Her Grace's monoplane, *The Spider*, arrived at Palapye Road, Bechuanaland, on their way back to Croydon. As reported in The Aeroplane for Apr. 23 *The Spider* left Maitland Aerodrome, Cape Town, on the return journey, on Apr. 21.

On Apr. 22 *The Spider* reached Broken Hill, Northern Rhodesia. On Apr. 24 it left Dodoma for Juba, which was reached the evening of the same day. The following day it resumed its flight and reached Khartum on the afternoon of the same day.

According to Mr. C. D. Barnard's special telegram to *The Daily Express*, disaster nearly overtook *The Spider* when the exhaust-pipe inside the muffle for heating the cabin burned away and allowed the exhaust gases to enter the cockpit. Mr. Barnard also said that *The Spider* was forced to land twice on Apr. 24, the first time because a gauge showed the engine to be losing oil. Investigation proved the gauge to be incorrect. The second time a terrific thunderstorm forced *The Spider* down at Numili, on the borders of the Sudan.

The Spider reached Heliopolis from Khartum on the evening of Apr. 26. The following morning it took off for Aleppo.

The Spider reached Aleppo on the evening of Apr. 27. The following day the machine left for Sofia which was reached in the early afternoon. On Apr. 29 *The Spider* left Sofia before sunrise on the last stage, and was forced to land after going some 30 miles.

THE CHALLENGE INTERNATIONAL DE TOURISME.

The entry list for the *Challenge International de Tourisme* which takes place between July 20 and Aug. 7 closed on Apr. 15.

There are 74 entries, representing 8 countries, and these are as follows: Germany 30, Austria 4, England 6, France 12, Belgium 1, Jugo-Slavia 1, Poland 16, and Switzerland 4.

This year's contest will be organised by the Aero-Club von Deutschland and will start from and finish at Berlin.

A full list of entrants will be published at a later date.

IMPORTANT DATES.

May 2.—Annual A.I.D. Dinner.
May 5.—R.A.F. Staff College, Second Term begins.
May 7.—Air League Dinner and Ball.
May 9.—De Havilland Technical School Dance.
May 10.—Athletics. Triangular Tournament: R.A.F.C., R.M.C., and R.M.A. at Woolwich.
May 10.—N.F.S. Meeting at Leeds.
May 15.—Dinner to Lord Wakefield by the R.Ae.S., the R.Ae.C., the S.B.A.C., and the Air League.
May 17.—Brooklands Flying Display and opening of Brooklands Aero Club.
May 29—June 14.—Royal Tournament at Olympia.
May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support).
June 7.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—R.A.F. Garden Party at Manston.
June 19.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gwynn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
July 3.—Indian Empire Garden Party at Hurlingham.
July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).
July 9—12.—R.A.F. Athletic Championships at Uxbridge.
July 13.—N.F.S. Meeting at Leeds.
July 19.—N.F.S. Meeting at Hull.
July 20—Aug. 7.—International Touring Competition, starting from Berlin.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

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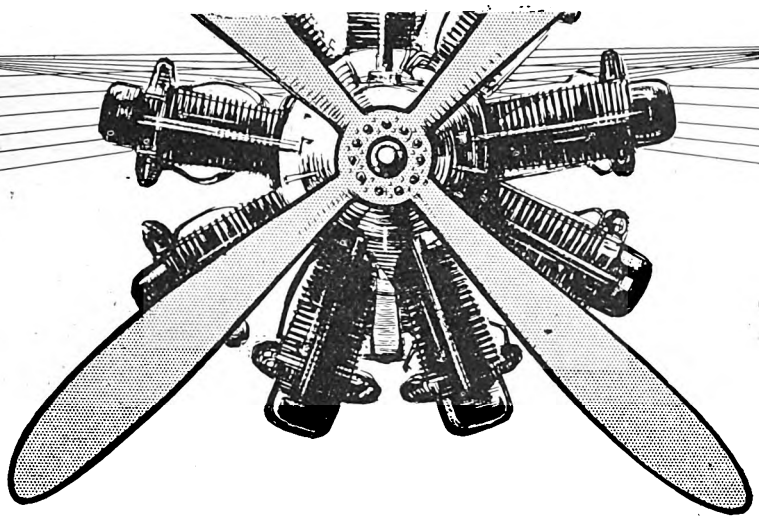

Magnificent record flight
by the

DUCHESS OF BEDFORD

with Capt. C. D. Barnard and Mr. R. Little
from England to Capetown
in 10 days,
in her "Jupiter" engined
Fokker monoplane, "Spider,"
was
accomplished on

"GOLDEN SHELL" OIL

and special petrol by Shell
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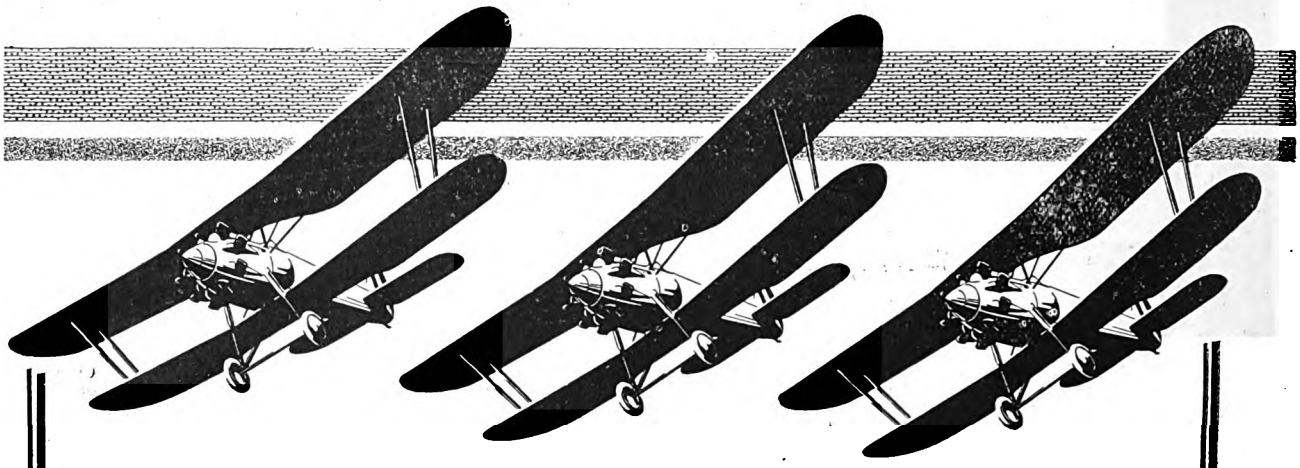

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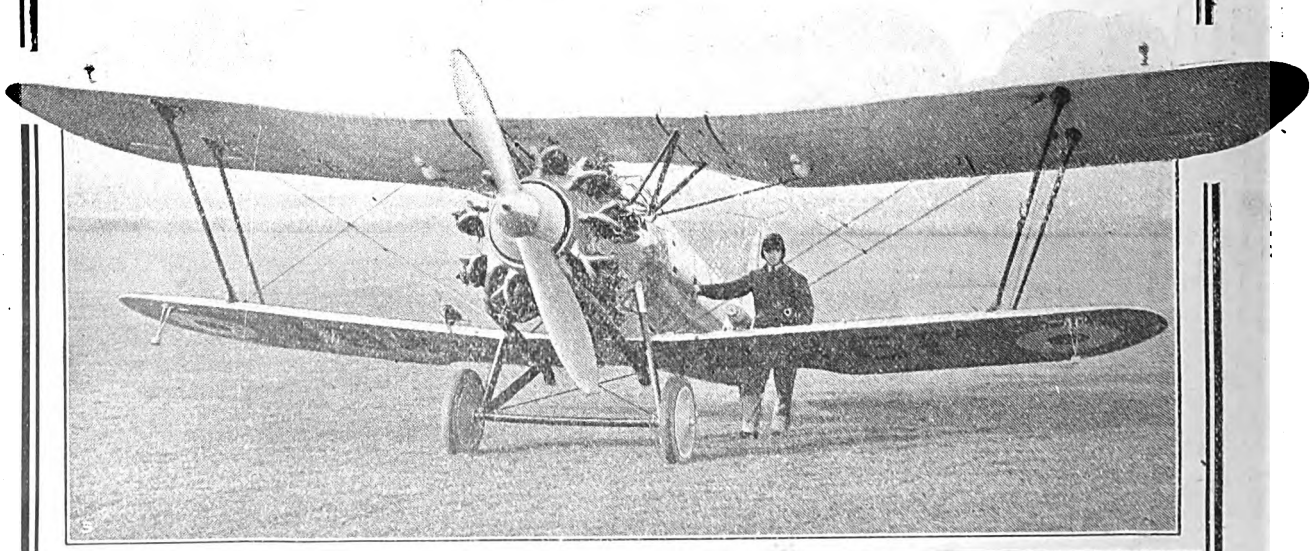

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THE ROYAL AIR FORCE.

LORD TRENCHARD ON AIR POWER.

The following letter, which appeared in *The Times* on April 25, is published by kind permission of the Editor of that paper:—

Sir,—I have read with great interest the article by Major-General Sir Frederick Maurice on "The Air Weapon: Function in War and Peace," in *The Times* of April 16. I fear I cannot write half as clearly as he does, but I would like to make the following comments on this discussion, which had its beginning in the House of Lords on April 9.

Sir Frederick's article seems to indicate that he assumes that we have never seriously investigated the rôle of the Royal Air Force in Imperial defence, and its relations with the other Services in this respect. This assumption is far from correct, as such an investigation has been both constant and vigorous for the past 10 or 12 years, and the results have been published from time to time.

Briefly, one rôle of the Royal Air Force is, as Sir Frederick surmises, to provide the Navy and Army with "eyes," and with air power as may be required by either or both of those Services for offensive or defensive purposes. Further, the Royal Air Force has also to defend this country against air attack in a major war—a specific responsibility at least as great as those of the Navy and Army in a major war. Therefore, although I did not mention this aspect in my speech in the House of Lords, namely, the rôle of the Royal Air Force in a major war, I think I may say that it is definitely and clearly known in the three Services.

The two older Services have at present an additional rôle in peace—that of policing the distant parts of the British Empire, and it is the suitability of the Royal Air Force for carrying out these particular peace-time duties in certain parts of the Empire that I would like to stress. The various British forces used for policing distant parts of our Empire were available for use in the last Great War, and were in some cases conveniently placed for the part they had to play in that War. It seems to me that the Royal Air Force should be able to do its share of this police work, and be at the same time as ready as ground forces to take its part in a major war, especially in co-operating with the Navy and Army.

In one part of Sir Frederick's letter he implies that we are advocating the allocation of police work to the Royal Air Force, and then states that we definitely failed in that respect in Palestine. I would point out that police work in Palestine is a question of keeping order under conditions peculiarly difficult for air action. It involves the maintenance of order in towns and populous districts between rival religions—work for which the Air Force has never claimed suitability. It has always been the opinion in the Royal Air Force that some ground forces also should have been kept in Palestine in view of the special conditions obtaining there. The Air Ministry is, of course, in control in Palestine because the defence of this country must be linked up with that of Transjordan, which is peculiarly suitable for air power. There are, however, many other parts of the British Empire very suitable for air control, where the difficult conditions existing in Palestine are not likely to arise.

Sir Frederick Maurice and others seem to look upon Air Force methods as being of a "tip and run" nature—bomb and run away. May I say that this, whether true or untrue, is not my view of air control, but merely of one of its stages—that is to say, when it is found necessary to take extreme measures. Air control has a much wider scope. Air control enables the Political Officer, who must work in much closer touch with air than he ever did with ground troops, to keep a constant watch over tribes and villages, the chiefs and people of the country he controls. It enables him to see just how the villages are situated, and gives him rapid communication with the most distant part of the country. Aeroplanes enable the chiefs to come into the centres where the civil authorities are, and takes from them the conception of a British civil power so distant that it is but a name.

The young air officer and airman are constantly visiting distant parts of the country under air control, and, to a much greater extent than under the old methods, becoming friendly with the local sheikhs—perhaps taking them for an aeroplane reconnaissance over their own towns or villages. Air is the greatest civilising influence these countries have ever known, owing to its powers of rapid communication. Air methods are, in short, the reverse of the old punitive column. Our policy is one of prevention, not only one of punitive action. The latter is necessary only occasionally, much more seldom than when chiefs and tribes were hardly ever visited and rarely became acquainted with the civil authorities who controlled their activities.

Sir Frederick pays a generous tribute, as do also others, to the work done by the Royal Air Force, but I maintain that the view they present of air control, that it means bombing and going away, and then either sending troops to occupy or bombing again, is not a correct appreciation of how air acts. It would be interesting to hear the opinion of a man like Sir Henry Dobbs, who acted as High Commissioner in 'Iraq, and who could say from his own experience whether air plays the part I have indicated in bringing the civil power into much closer touch with the country than was ever possible by other means.

And if air control saves money, there will be so much more money for the making of roads, which, as Sir Frederick Maurice states, Lord Rawlinson did so successfully in Waziristan. I agree that roads are very desirable,

ROYAL COMMUNICATIONS.—The R.A.F. Westland Wapiti, in which H.R.H. the Prince of Wales flew from Marignane to Windsor on April 25, on His Royal Highness's private landing ground in Windsor Great Park. The two escorting machines cannot be seen, but on the left are two Service Moths.

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because they mean quicker communication, and if this is so, air control must be a desirable system, providing as it does the most rapid communication possible.

I will not here go into all the questions of air defence and offence in a major war, more than to say that I regard air as having the same principle in defence as the Army or the Navy. We call it all "defence"—every nation calls it so, but no defence can be successful (we saw this in the last War) that has not some means—and at times considerable means—of offensive action. What proportion should be defensive action and what offensive has been debated time and again.

Finally, I would like to say I agree that in much the three Services must be inter-dependent. Of course they are, and always will be, not only inter-dependent, but also linked inseparably with the whole political, economical, and industrial life of the nation, and with all its activities.

I am, etc.,
TRENCHARD.

Dancer's Hill House, Barnet, Herts, April 23.

The London Gazette.

Air Ministry, April 22.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—Lt.-Cdr. A. G. Elliot, R.N., is reattached to the R.A.F. as a Flt. Lt. with effect from April 11, 1930, and with seniority of Oct. 13, 1926; Flt. Lt. J. M. J. C. J. I. Rock de Besombes is restored to full pay from half-pay (April 12).

The following are promoted with effect from April 23:—FLT. LTS. TO BE SQ. LDRS.—A. C. Bayley, H. G. White, W. A. K. Dalzell.

FLG. OFFS. TO BE FLT. LTS.—A. G. Pickering, A.F.C., J. C. C. Slater, J. C. H. Tavendale, G. B. Beardsworth, H. E. Power, E. D. MacL. Hopkins.

Wing Cdr. P. C. Sherren, M.C., is placed on the half-pay list, scale A (April 19); Sq. Ldr. P. Warburton, M.B.E., is seconded for duty under the 'Iraq Government (April 1); Flg. Off. A. Lanman, M.B.E., A.F.C., is placed on the retired list (April 17); Flt. Lt. A. Hunter, O.B.E., is placed on the retired list on account of ill-health and is granted permission to retain the rank of Sq. Ldr. (April 18); Flg. Off. R. Matheson is transferred to the Reserve, Class A (April 22).

The following Lts., R.N., Flg. Offs., R.A.F., cease to be attached to the R.A.F. on return to Naval duty:—G. R. F. T. Cooper (Mar. 28); G. H. Birley (April 8); A. Brock (April 11); C. N. Lentaigne (April 14). Flg. Off. T. K. Merrett relinquishes his S.S. comn. on transfer to the Indian Army (April 18). The S.S. comns. of the following Plt. Offs. on probation are terminated on cessation of duty (April 23):—D. Holt, F. Woodward.

MEDICAL BRANCH.—The S.S. comn. of Flg. Off. A. H. Barzilay, M.B., Ch.B., is antedated to Oct. 1, 1929, and he ceases to be seconded to the Royal Southern Hospital, Liverpool (April 2).

MEMORANDA.—The permission granted to H. G. Hall to retain the honorary rank of Lieutenant, which was withdrawn on his enlistment in the R.A.F., is restored on his discharge (Mar. 14). The permission granted to Capt. H. W. R. Haselhurst to retain the rank of Major, which was withdrawn on his appointment to a comn. in the Army, is restored on his retirement from the Army (Mar. 16).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—B. Icely, L. A. Robertson (April 2); I. C. Bird (April 3); G. B. Shields (April 7); P. R. Nickols (April 8).

W. H. Armstrong is granted a comn. in the Special Reserve as a Plt. Off. on probation (Mar. 13).

The following Plt. Offs. on probation are confirmed in rank:—W. R. Sadler (Mar. 21); W. McF. Russell (Mar. 25). Flg. Off. J. F. Greenwood relinquishes his comn. on account of ill-health and is permitted to retain his rank (April 23).

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 600 (CITY OF LONDON) (BOMBING) SQUADRON.—Plt. Off. N. Montefiore resigns his comn. (Mar. 14).

Appointments.

Week ending April 28.

GENERAL DUTIES BRANCH.—Group Captains C. D. Breese, A.F.C., to H.Q., 'Iraq Command, for Engineer Staff duties, 11/4. R. H. Verney, O.B.E., to R.A.F. Depot, Uxbridge, on transfer to Home Establishment, 22/3.

Wing Commanders The Hon. L. J. E. Twisleton-Wykeham-Fiennes, to Special Duty List, on appointment as Air Attaché, Washington, 1/4. F. Sowrey, D.S.O., M.C., A.F.C., to No. 1 School of T.T. (Apprentices), Halton, for Administrative duties with No. 2 Apprentices' Wing, 16/4.

Squadron Leader P. Warburton, M.B.E., to Special Duty List, on appointment as Inspector of 'Iraq Air Force, 1/4.

Flight Lieutenants A. S. Thompson, to R.A.F. Depot, Uxbridge, 7/4. J. Duminy, to R.A.F. Record Office, Ruislip, 14/4. L. G. Harvey to H.A.D., Henlow, 8/4. J. C. Barraclough, to H.A.D., Henlow, 7/4. R. E. M. B. Milne, to No. 503 Sqdn., Waddington, 13/3. J. N. D. Anderson, to R.A.F. Base, Gosport, 14/4. F. W. Wiseman-Clarke, to No. 32 Sqdn., Kenley, 22/3. J. C. M. Hay, to School of Naval Co-operation, Lee-on-Solent, 9/4.

Flying Officers F. W. Wrench, to E. and W. School, Cranwell, 10/4. F. H. H. Twelvetree, to R.A.F. Base, Gosport, 8/4. H. F. G. Southey, to E. and W. School, Cranwell, 28/3. P. G. J. Atkinson, to R.A.F. Depot, Uxbridge, 13/3. R. Chadwick, to No. 202 Sqdn., Malta, 11/4. H. G. Loch, to R.A.F. Practice Camp, North Coates Fitties, 22/4.

Pilot Officers J. D. Rutherford, to No. 202 Sqdn., Malta, 11/4. J. E. Loverseed and E. J. K. Megaw, to No. 2 Sqdn., Manston, 1/4. H. C. Singleton, to No. 4 Sqdn., S. Farnborough, 1/4. G. Farnhill, M. E. M. Perkins and E. H. Coleman, to No. 13 Sqdn., Netheravon, 1/4. R. Todd, F. Whittingham and D. H. G. Wood, to No. 26 Sqdn., Catterick, 1/4. A. E. Smith, to No. 7 Sqdn., Worthy Down, 1/4. W. R. A. Matheson and L. F. H. Orr, to No. 9 Sqdn., Manston, 1/4. R. Ellison, to No. 17 Sqdn., Upavon, 1/4. E. L. Brackenbury, to No. 19 Sqdn., Duxford, 1/4. G. W. Phillips and M. Watson, to No. 23 Sqdn., Kenley, 1/4. P. R. May, to No. 25 Sqdn., Hawkinge, 1/4. V. B. Myers and M. V. Ridgeway, to No. 29 Sqdn., North Weald, 1/4. L. McHardy, to No. 33 Sqdn., Eastchurch, 1/4. E. H. Bellairs, to No. 41 Sqdn., Northolt, 1/4. N. C. Singer, W. K. Brett and K. D. Knocker, to No. 54 Sqdn., Hornchurch, 1/4.

MEDICAL BRANCH.—Squadron Leaders P. H. Young, to R.A.F. Training Base, Leuchars, 17/5. T. K. Place (Dental), to R.A.F. Depot, Uxbridge, 11/4.

Flight Lieutenant J. F. McGovern, to Station H.Q., Hornchurch, 17/5.

Flying Officers G. W. Paton, to R.A.F. General Hospital, 'Iraq, 10/4. A. H. Barzilay, to Medical Training Depot, Halton, 2/4.

STORES BRANCH.—Squadron Leader A. T. Cooper, to R.A.F. Depot, Uxbridge, 8/4.

Flight Lieutenant A. H. Comfort, to M.A.E.E., Felixstowe, 5/4.

Flying Officer W. H. Bowden, to No. 604 Sqdn., Hendon, 29/3.

ACCOUNTANT BRANCH.—Flying Officer H. A. Frost, to No. 501 Sqdn., Filton, 2/4.

H.R.H. the Prince of Wales.

H.R.H. Group Captain the Prince of Wales, K.G., made the last section of his homeward journey from Africa in a Service Westland Wapiti (Jupiter engine) of No. 24 (Communication) Squadron, piloted by Sq. Ldr. D. S. Don, M.V.O.

His Royal Highness embarked in the Wapiti at Marignane aerodrome near Marseilles at 07.35 hours on Apr. 25, an hour and a half after the liner in which he had travelled from Port Said docked at Marseilles. His machine was escorted throughout the journey by another Westland Wapiti and a Fairey III.F of No. 24 (Communication) Squadron.

The Prince's machine and escort alighted at Bron aerodrome, near Lyon, at 08.45 and His Royal Highness was entertained by the officers of the 35th Air Regiment.

He left Bron at 09.25 and, because of the weather and bad

NIGHT OPERATIONS.—A Vickers Virginia of No. 58 (Bomber) Squadron outside the sheds at Worthy Down being prepared for the reliability trials for Night Bomber Squadrons on April 23.

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country, flew by way of Dijon to Le Bourget, instead of following the direct route.

They reached Le Bourget at 11.55 hours and the Prince of Wales lunched with the officers of the 34th Air Regiment. They left again at 13.40 hours and were escorted to the coast of France by the French Squadron.

They crossed the coast at Cape Griz Nez and were escorted across the Channel by a flying-boat of the R.A.F. from Calshot. Near Folkestone they were met by No. 25 (Fighter) Squadron which escorted the Royal Flight to Windsor.

His Royal Highness alighted at Windsor at 15.55 hours. The actual flying time for about 615 miles was 5 hours 55 minutes.

The three machines of the Royal Flight had taken 9 hours to fly from Northolt to Marignane,—and the journey either way takes 20 hours by train and boat.

The Night Bomber Squadrons' Exercises.

The annual long-distance exercises by Night-Bomber Squadrons of the R.A.F. took place between 15.00 hours on April 22 and 08.00 hours on April 23 and between 15.00 hours on April 24 and 08.00 hours on April 25. Flying was washed-out on the intervening night because of bad weather.

These exercises are part of the annual training programme of the Night-Bomber Squadrons of the Air Defence Defence of Gt. Britain command.

The Squadrons which took part were No. 7 (Bomber) Sqdn. Worthy Down, No. 9 (Bomber) Sqdn. Manston, No. 10 (Bomber) Sqdn. Upper Heyford, No. 58 (Bomber) Sqdn. Worthy Down, and No. 99 (Bomber) Sqdn. Upper Heyford. No. 10 and No. 99 Squadron are equipped with Hyderabads and the others with Virginias.

Each Squadron's route began at its own aerodrome and followed a circular course with four turning points. Umpires were stationed at each turning point. Details of the course, — which was Worthy Down, Andover, Bicester, Bircham Newton, Andover, Worthy Down,—were not available to the competitors until twenty-four hours before the event.

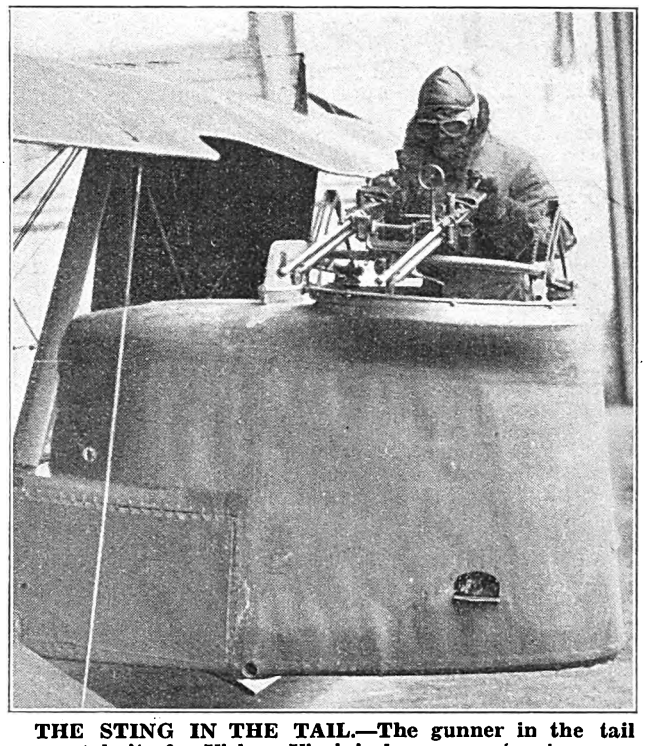
Each Squadron entered eight aircraft and eight crews. Aircraft were despatched with a suitable interval between each and proceeded individually. Each aircraft entered could gain 200 marks divided into 80 for reliability, 80 for air pilotage, and 40 for signals.

The Map Reading Competition.

The Royal Air Force Map Reading Test for Fighter Squadrons, for a Trophy presented by Sir Philip Sassoon, has recently been completed. Official Air Ministry information is that the result is not yet known, but THE AEROPLANE understands from another source that the competition was won by No. 29 (Fighter) Squadron with No. 43 (Fighter) Squadron as runners-up.

This Map Reading Test is known in the Service as the "Pin-Pointing Competition" and the rules and conditions governing it were published in THE AEROPLANE of June 26, 1929.

No. 29 (Fighter) Squadron is stationed at North Weald and is commanded by Sq. Ldr. P. G. Scott. No. 43 (Fighter) Squadron is stationed at Tangmere and is commanded by Sq. Ldr. C. N. Lowe, M.C., D.F.C. Both Squadrons are equipped with Armstrong Whitworth Siskins (Jaguar engines).



THE STING IN THE TAIL.—The gunner in the tail cockpit of a Vickers Virginia long-range bomber.

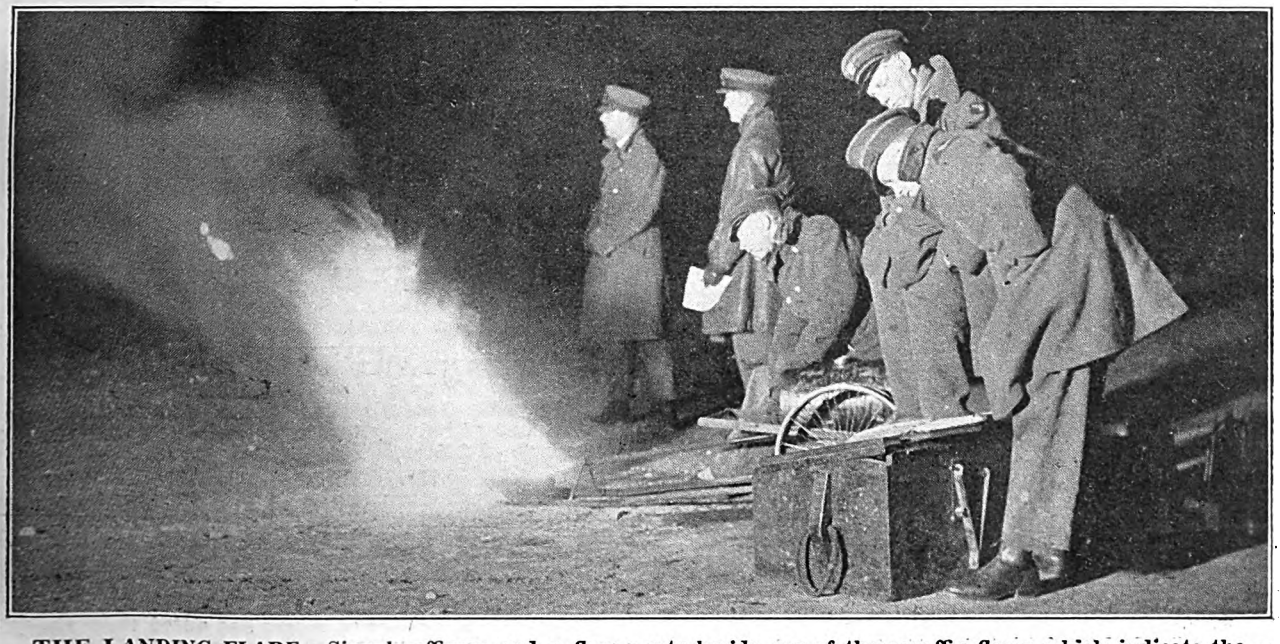
Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Heliopolis, Egypt, to a Fairey III.F machine of No. 47 (Bomber) Squadron, Khartum, on April 23, Plt. Off. Francis Slade Barron, the pilot of the aircraft, and 364028 AC.1. Cyril Fred Davis were killed.

Judging by the newspaper reports the engine failed as the machine was leaving the aerodrome and owing to bad visibility the pilot stalled in an attempt to land.

The Air Ministry regrets to announce that as the result of an accident at Cranwell to an Avro machine of the Royal Air Force College, Cranwell, on Apr. 25, 1930, No. 328556, Sjt. William Henry Fearn, the pilot of the aircraft, and No. 560080, AC.1. Leslie Edward Charlton, were killed.

At the inquest at Cranwell on April 26, Flg. Off. J. Mutch said that Sjt. Fearn was an experienced pilot. He was making a test flight in a machine he had flown for about two years. AC.2. H. T. Tring said that he saw the machine in the air flying quite normally and apparently about to make a landing. When it got to within 50 feet of the ground it suddenly shot upwards and black smoke came from underneath it. Just as it began to go up it stalled, the nose came down and it went into a short spin. The Coroner returned a verdict in accordance with the medical evidence.



THE LANDING FLARE.—Signals officers and a flare-party beside one of the paraffin flares which indicate the edge of a landing ground during the Service night-flying exercises.

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Sir Philip Game.

Air Vice-Marshal Sir Philip Game, G.B.E., K.C.B., D.S.O., who has recently been appointed Governor of New South Wales, left London on April 23 on his journey to Australia.

Among those who were present at his departure from Victoria Station were Air Commodore F. V. Holt representing the Air Council, Marshal of the R.A.F. Lord Trenchard, Air Chief Marshal Sir John Salmond, and Air Marshal Sir John Higgins.

Another Pioneer Departs.

The London Gazette of April 15 announces that Group Captain U. J. D. Bourke, C.M.G., is placed on the retired list at his own request.

Group Captain Bourke was born in 1884 at Walmgate, York, and was educated at Cheltenham and at the Royal Military College, Sandhurst. He was appointed to a commission in the Oxfordshire and Buckinghamshire Light Infantry in 1903 and was promoted Lieutenant in 1906. He learned to fly in a Deperdussin monoplane at Hendon and his Royal Aero Club Certificate, No. 479, is dated May 9, 1913. In August 1913 he was attached to the Royal Flying Corps and graded as a Flying Officer and posted to No. 2 Squadron. He was promoted to Captain in the Army in April 1914, and Flight Commander, R.F.C., the following month.

In August 1914 he went with No. 2 Squadron to France and with Major Longcroft as pilot made one of the first air reconnaissances of the War. He returned to England in October 1914 for three months on the Home Establishment. In March 1915 he was promoted to the temporary rank of Major and graded as a Squadron Commander. In June 1915 he took the newly-formed No. 10 Squadron to France and remained in command of the Unit at Chocques Aerodrome for a year.

In June 1918 he was promoted to the temporary rank of Colonel and graded as a Wing Commander. In November 1918 he was promoted to Major in his Regiment. In August 1919 he resigned his Army Commission on appointment to a Permanent Commission in the R.A.F. with the rank of Group Captain.

He was mentioned in Dispatches in 1914 and in 1916 and in the King's Birthday Honours of 1919 he was made a Companion of the Order of St. Michael and St. George for distinguished services rendered during the War.

In November 1920 he was appointed to command the Palestine Group, Middle East Command. He was restored to the Home Establishment in November 1921 and placed on the half-pay list. In April 1922 he was appointed to command the Inland Area Aircraft Depot, Henlow. In July, 1925, he was posted to the Air Ministry, Directorate of Equipment, and was nominated by the Air Council to the Board of Management of the Navy, Army, and Air Force Institutes. In November 1926 he was appointed Chief Staff Officer, Wessex Bombing Area.

He was placed on the half-pay list in January 1929.

Special Assessments.

The following officers and airmen have been awarded special assessments as shown on completion of courses of *ab initio* flying training at the Flying Training Schools indicated:—

No. 1 Flying Training School, *Distinguished Passes.*—Plt. Off. H. P. Fraser, Plt. Off. G. N. Roberts, Plt. Off. G. J. C. Paul, No. 508340 Sjt. J. F. Rose, No. 363895 Sjt. A. R. Allen.

No. 4 Flying Training School, *Distinguished Passes.*—Plt. Off. R. P. Cauthery, Plt. Off. P. B. Lusk, No. 363818 Sjt. W. Corden, No. 363966 Sjt. A. A. F. Hickman, No. 363592 Sjt. C. J. Fox.

No. 5 Flying Training School, *Special Distinction.*—No. 364023 Sjt. H. Z. Foreman. *Distinguished Passes.*—Plt. Off. A. J. Tunnard, Plt. Off. D. H. F. Barnett, Plt. Off. H. A. Shotter, No. 363845 Sjt. S. Bannister.

Notations have been made in the official records of the officers and airmen.

Specialist Courses.

The following officers holding permanent or short-service commissions have been selected to attend the specialist courses indicated during 1930. No further selections will be made except to fill vacancies caused by reason of withdrawals from the list:—

Engineering, *Home Aircraft Depot, Henlow, Aug.* 4.—Abrams, W. G.; Allen, A.; Ashton-Jinks, C. P.; Barwell, P. R.; Bradley, P. F. G.; Brake, K. S.; Bruce, J. D. F.; Campbell, G. E.; Donkin, R. H.; Edwards, R. C.; Freebody, W. L.; Gibbon, D. W.; Kellett, R.; Miller, A. P.; Mills, R. L.; Morshead, V. D.; Owen, A. H.; Pike, T. G.; Pratt, A. E. J.; Shenton, R. F.; Snaith, L. S.; Stapleton, P. J.; Steedman, E. B.; Tuttle, G. W.; Walker, G. H.; Walker, H. J.; Wards, E. L. S.; Waring, H.; Wisher, H. G.; Yarde, B. C.

Signals, *Electrical and Wireless School, Cranwell, Sept.* 1.—Arbuthnot, T. J.; Calwell, A. K. K.; Chamberlain, G. P.; Cooper, W. C.; Hamblin, R. K.; Hatcher, V. G. A.; Keens, L. T.; Nicholas, B. D.; Southey, H. F. G.

Armament, *Armament and Gunnery School, Eastchurch, Mar.* 4.—Patch, H. L.; Slater, J. C. C.; Proud, H. J. E.; Abraham, T. M.; Heard, C. M.; Hopkins, E. D. McL.; Spreckley, H. D.

Photography, *School of Photography, Farnborough, Jan.* 6.—Merton, W. H.

Navigation, *R.A.F. Base, Calshot, Jan.* 14.—Campbell, J. H. McN.; May, F. M. V.

Extensions of Service.

The following officers have been selected by the Air Council for retention on the active list until they attain the age of 50. Extended service will begin on the dates stated against their names:—

Flight Lieutenants H. J. Adkins (June 6, 1930), L. J. Chandler, M.B.E. (June 19, 1931).

Flying Officers F. W. Foster, D.F.C., D.S.M. (June 19, 1931); G. N. Coward, C. H. V. Hayman, J. W. Hutchins, C. Snow, W. Wheatley (Jan. 18, 1932).

The application made by Flt. Lt. H. P. G. Leigh is still under consideration.

Applications from officers who become due for compulsory retirement between Mar. 31, 1932, and Mar. 30, 1933, will be considered in Apr. next, and should reach the Air Ministry not later than Mar. 31, 1931.

Long Service and Good Conduct.

The Long Service and Good Conduct Medal has been awarded to the undermentioned airmen with effect from the date given after each name:—

812 S-M.1 Brown, G., 6.2.30; 569 S-M.1 Walls, J., 6.8.29; 314954 S-M.2 Fletcher, J., 31.10.29; 439 S-M.2 Gregory, W., 13.9.29; 134587 S-M.2 Jones, G., 24.10.29; 127477 S-M.2 Lea, F., M.M., 19.10.29; 953 F-S. Faulkner, J. W., 19.1.30; 314890 F-S. Hamilton, D. W., 9.9.29; 849 F-S. Holt, J. D., 14.10.29; 10795 F-S. Ridley, P., 24.2.29; 78284 F-S. Russell, F., 17.1.30; 844 F-S. Salter, E., 6.11.29; 136903 F-S. Searle, G. E., 12.1.30; 338123 Sjt. Bettany, A. L., 18.12.29; 794 Sjt. Morrison, H., 19.4.29; 315014 Sjt. Thompson, T., 24.4.29; 334504 Cpl. (A/Sjt.) Durham, J. S., 24.8.29; 134793 Cpl. Irving, A., 23.1.30; 340919 Cpl. Mundy, S. F., 7.11.29; 10804 Cpl. Thornton, L., 16.12.29.

The R.A.F. Old Comrades' Association.

At a meeting of a number of past members of the R.N.A.S., R.F.C. and R.A.F., at the "Dr. Butler's Head" Restaurant, E.C., on Wednesday, Apr. 23, an Old Comrades' Association for past members of the flying services was formed.

Sq. Ldr. J. L. K. Pearce, O.B.E., R.A.F.O., who acted as Chairman of the meeting, outlined the need for, and scope of, such an organisation, and suggested that its aims should be social rather than charitable. He pointed out that an organisation already existed for those in need and that any other schemes would merely overlap.

Several people suggested that steps should be taken to get the movement going before the date of the R.A.F. Display this year, so as to take advantage of the fact that a large number of ex-R.A.F. *personnel* would be in London and could attend a meeting or function that would definitely put the Association "on the map."

A Provisional Committee was elected to arrange preliminary details, and these will be published as soon as possible after the first meeting on Apr. 30.

The Old Comrades' Association should make a strong appeal to all who have been "on the strength." Its future would seem to be assured before its formation and judging by the spirit and enthusiasm shown at the first general meeting it is long overdue.

Although the Association is formed primarily for the linking up of old friendships and general social activities, it is most likely that it will become a very strong and influential force.

Those who cannot wait for the preliminary details of the movement to be announced, are advised to communicate with Mr. Willian Coen, who is the Editor of *The Planesman*, and Hon. Secretary of the Association, at Ground Training Sect., A. and G. School, R.A.F., Eastchurch, Kent.—C. A. S.

The R.A.F. Athletic Championships.

The R.A.F. Athletic Championships will be held at Uxbridge on July 9, 10, 11, and 12.

Entries, giving ranks, names and initials of competitors, also returns from Commanding Officers showing the accommodation required, must reach the Hon. Secretary, R.A.F. Athletic and Cross-Country Association, R.A.F. Depot, Uxbridge, not later than by the first post on June 25. No entry after that date will be accepted.

Commanding Officers are requested to ensure that the banners used in the march-past of athletes on the first day are of the correct colours allotted to the various stations by the R.A.F. Sports Board. All inquiries regarding colours should be addressed to the Secretary, R.A.F. Sports Board, Air Ministry, Room 840, Alexandra House, Kingsway, W.C.2.

THE SECRETARY OF STATE FOR AIR.

The *London Gazette* of Apr. 22 announces that Colonel (Hon. Brigadier-General) Lord Thomson, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

AIR MINISTRY BUILDINGS.

In the House of Commons on April 16, in reply to a question by Sir K. Wood, the First Commissioner of Works said that it had been decided to erect new Government Offices on the site of Whitehall Gardens and Montagu House, and a Bill to give effect to this decision would be introduced in the Autumn Session.

An official of the Office of Works has stated that the Air Ministry and other Government Departments will be accommodated in the new building.

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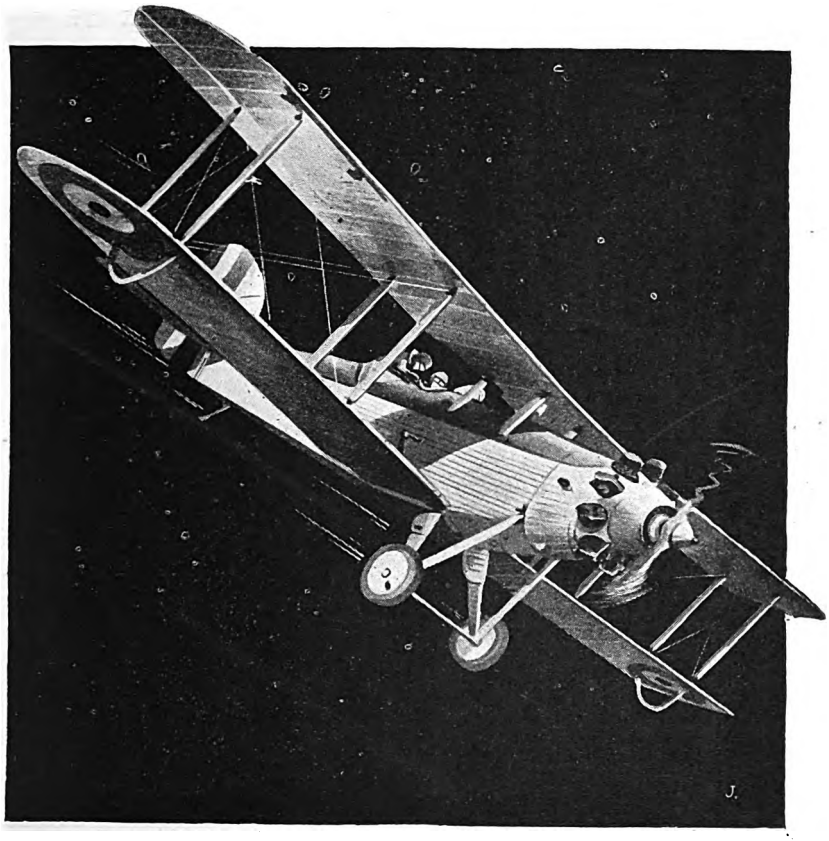

WESTLAND WAPITI MARK IIa, WITH JUPITER VIII ENGINE.

Westland Aircraft represent the latest developments in design and construction. The Westland Aircraft Works is equipped for the production of commercial and military machines of outstanding efficiency. The latest productions include the Westland Wapiti IIA, a general purpose aircraft; the Westland Three-Engined Limousine; the Westland Wizard II High Speed Single Seater Fighter, etc.

4 Wapitis equipped with Bristol Jupiter VIII Engines recently delivered to the Royal South African Air Force accompanied the R.A.F. Flight from the Cape to Cairo.

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AS SUPPLIED TO THE R.A.F., R.A.A.F., R.S.A.A.F.

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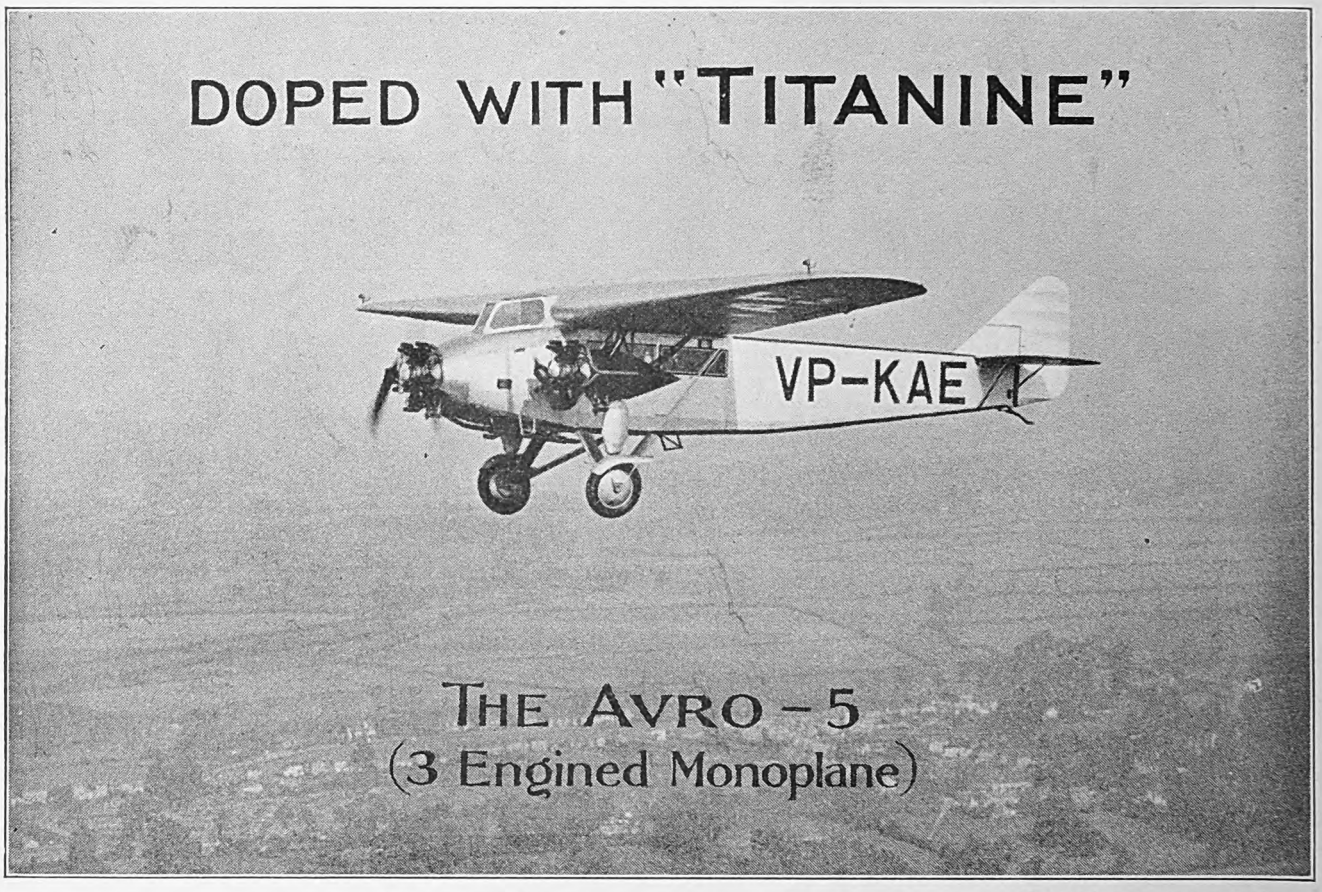

("Aeroplane" photograph.)

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AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

AIRCRAFT AS TRANSPORT VEHICLES.

BY C. C. WALKER, A.M.INST.C.E., A.F.R.AE.S.
CHIEF ENGINEER OF THE DE HAVILLAND AIRCRAFT CO. LTD.

A man riding a bicycle at 15 m.p.h., who weighs 160 lbs. and can exert one-eighth of a horse-power, is doing a job of transport which can best be described as 8¾-ton miles per horse-power hour—the man himself being regarded as the paying load.

A horse-drawn barge will do 100 ton-miles per h.p. hour, a motor-omnibus 7.55, a motor-cycle .5, a touring car rather more, a goods train with sufficient reserve power to "unstick" and climb a 1 in 100 gradient can do 12 ton miles per h.p. hour at 35 m.p.h., a passenger train 5 at the same speed, and an aeroplane from .3 to .45 at 100 m.ph. The figure refers to the paying load in each case.

How do all these methods of conveyance stand in relation to one another? The figures just given may be taken as a criterion of performance if time is no object in transport. The man on the bicycle is, at 15 m.p.h., only just beginning to feel the main object of his efforts, namely, the horizontal transport through the air of 160 lbs., and he is only able to do this because the very high efficiency of his propelling mechanism enables him to do a high speed for his weight per horse-power of some 1,300 lbs.

Speed has to be paid for in power, and in assessing the relative merits of these methods due regard must be paid to this fact. If the cyclist had to do his job at 100 m.p.h. instead of 15 (his rolling resistance being negligible) he would have to be endowed with 37 h.p. and his performance would come down from 8¾ to .19 ton-miles/h.p. hour, or only half that of the aeroplane, which is not surprising in view of his lack of streamlinedness. Other forms of locomotion show similar results. The fact is that in the slower methods the essential business of moving the load through the air requires so little power that it is swamped and lost in various side shows.

If the aeroplane's performance could be scaled down to the speed of the barge, it would be 40 times more efficient in this sense than the barge. Such comparisons are, of course, fantastic, but it seems reasonable, at any rate in high speed transport, to consider that the useful work done is the horizontal transport of the paying load in its containing vessel through the air, and that any other expenditure of power is merely a loss necessarily incurred.

Looked at in this way, the aeroplane has a fuel or horse-power economy not reached by any other means, and although a relatively large expenditure of horse-power hours is necessary, more of it is being directly expended on the object in view than with any other form of transport.

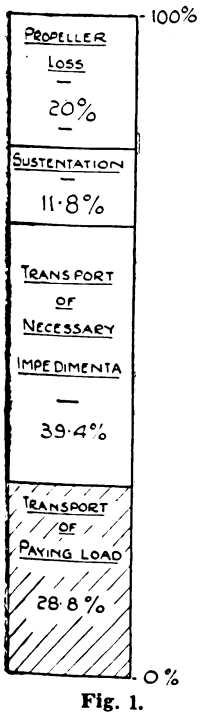

Fig. 1.

Fig. 1 shows how the b.h.p. is expended in a fairly efficient aeroplane with a low landing speed when flying at rather over 100 m.p.h., and it will be seen that what has been termed the useful work represents only 29% of the whole. It should be added that the practical requirements of view, ventilation, housing of the power-plant, and so on, all figure in this item, and so it is a quantity capable of alteration rather than a fixed reference datum.

The "necessary impedimenta" in the figure include the wings, or rather their frictional resistance, which is not directly concerned with the keeping up in the air of the machine. Only a small amount of wing is wanted for transport purposes, their chief function being to lift the load clear of the ground in a safe way before starting.

Fig. 1 happens to represent an aeroplane which is not loaded up to the limiting "get-off" for British requirements. If it were, the efficiency shown of 28.8% would be higher. To increase still further this efficiency the wings would have to be reduced in size and more power installed in order to secure the same "take-off." A much larger proportion of Fig. 1 would now consist of "transport of paying load," and the speed and the horse-power used would also be higher. This merely illustrates the fact that one must pay for speed even though the power is concentrated more completely on the object in view.

As we have seen that increased speed involves an increased expenditure of horse-power hours to do a given transport job (as a matter of fact this increase is as the square of the speed) irrespective of the nature of the vehicle we will leave this aspect alone, and concentrate on the aeroplane in a more practical way, that is to say we will assume that speed is no object and an unlimited load has to be moved from A to B.

There are two general aircraft design questions involved in this. The first concerns the power the units should be—many small or few large—and the second, having decided on the power of each unit, what size wings, etc., it should have—large wings with large paying load and low speed, or vice-versa.

So far as the first question is concerned, as the size of the unit is increased the load carried per pilot goes up, but at the same time the percentage of structure weight also increases and encroaches on what is available for load. The best compromise naturally varies with the amount of fixed equipment carried, the range, etc. It might be as low as a 250 h.p. machine, but will usually be higher.

It is in any case calculable beforehand, and it will be assumed here to be an aeroplane with an engine of round about 500 h.p. It may be remarked that the increase of structure weight just referred to is sometimes concealed in large aeroplanes by increasing the landing speed and thereby reducing dimensions. A very large aeroplane with a very low landing speed is not a practical proposition.

On the second question, if we settle on the 500 h.p. engine, there are many different factors to be taken into account. A lightly-loaded, low landing-speed machine will (unless it is an extreme case) carry a larger paying load, but, on the other hand, being slower the fuel and pilot charge per journey will be higher. The light loading and consequent large size will incur a higher structure weight.

Again, these conflicting factors are all calculable, and Fig. 2 shows the characteristics of a range of machines of various load-carrying capacities, and, therefore, wing loadings, which could make use of a 500 h.p. engine The paying load is limited by the British take-off requirement in all cases and the speed is always based on a throttled b.h.p. of 320.

These results having been produced for a 1921 aeroplane do not necessarily represent what can be done now, and further, they can be greatly modified in character by, say, an increase in "cleanness" or by many other factors. They are exhibited to illustrate the magnitude of the conflicting factors noted above, under the particular conditions selected. It will be noted that the largest paying-load per horse-power is not necessarily the best paying proposition even where speed is no object.

That part of Figure 2 which shows the cost in money of achieving a ton-mile is purely comparative.

The figures at the side do not represent any concrete sums, for it would obviously be impossible to show this, but they take account of the effects of changing the wing area (and hence size and speed) on the load carried per pilot, the fuel used per mile, the aircraft and engine maintenance per mile, the first cost of the aeroplane with its effect on insurance, maintenance, and so on, and all the things in fact which are influenced by the character of the aircraft.

It has been necessary in order to do this to include a figure to represent those costs which are independent of the type of aircraft used. This figure has been guessed at 35% of the total cost for a service of machines with a wing loading of 10, and it has been assumed that all machines on the curve fly the same number of hours per annum. The 35% would represent the proportion of overhead and management charges.

The question of cost has been introduced to get into a

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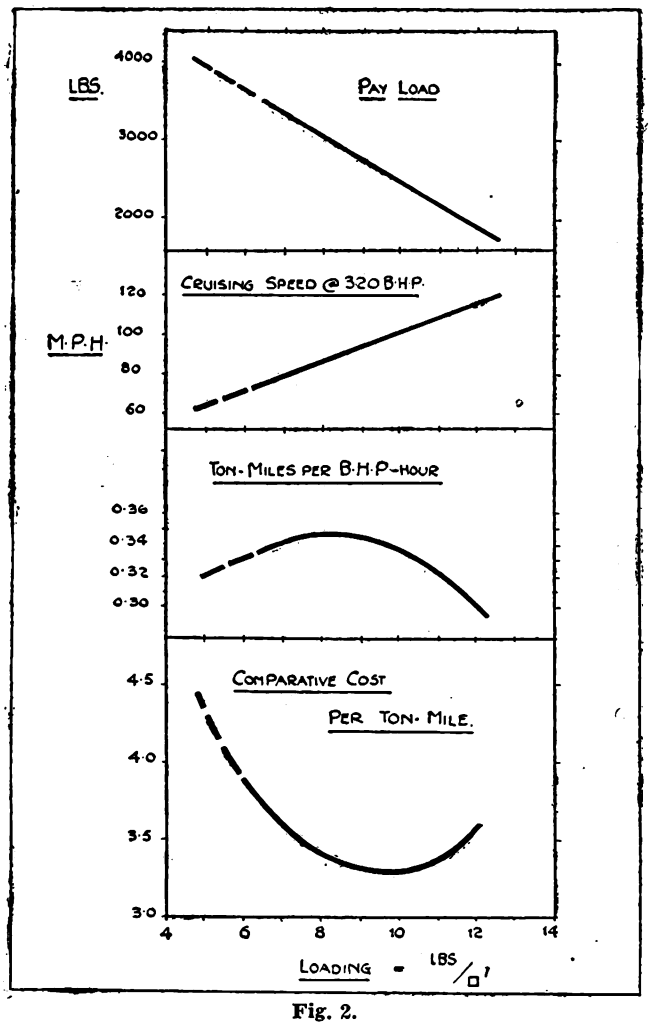

Fig. 2.

proper perspective the effects of what may be termed the design policy in an aerial transport vehicle. One particular set of conditions has been taken to illustrate this, but the effects shown must exist however masked they may be by other conditions of service. The "Horsepower hour" has been used as the criterion because such important items as engine maintenance, obsolescence, fuel, oil, together with a large proportion of the cost of equipment, insurance, etc., are all directly concerned with it.

There is much more which might be discussed regarding the future of the aeroplane as a transport vehicle, and one must recognise that the pioneering problems faced by air transport companies at present are not perhaps of a kind which are affected very greatly by the economics of the vehicle. If the L.M.S. Railway were to run only two trains a day on their system, the actual running expenses might be doubled or halved without affecting the total cost of transport very much. If one might look ahead somewhat to, say, a lighted route to India with half a ton a day of express matter to be relayed there in 2½ days, then the economics of the vehicle will come into the picture.

The general public probably do not realise that a man can be carried 100 miles in an hour for 2½ gallons of petrol, or a ton of goods the same for under 20 gallons. Speed is certainly well worth its price now, and as can be seen from Fig. 2, aircraft escape the law that the transport return diminishes as the square of the speed.

The reason for this is easy to see. The slow landing aeroplane is encumbered with a large amount of wing wheels, etc., which have to be transported along with the load in its containing vessel. The latter is the real useful work done, and is that part which is subject to the diminishing return of ton-miles per h.p. hour, as the square of the speed increases.

We will now leave the question of the best size of aeroplane to make when the power is fixed and the landing speed, and therefore load (for a given take-off) is varied. The other problem referred to above of what is the best power to use in each unit is very important and is one on which there is a considerable amount of misconception so far as land aeroplanes are concerned.

If 20 passengers have to be carried it will be more economical to divide them into two machines, carrying 10 each, and it might be even better to split them up into four machines carrying five each. If a large amount of fixed equipment has to be carried then the large unit must be used, but the loss in efficiency will be there whether it is present as an increased percentage structure weight or whether, as is usually the case, the landing speed has been increased to avoid this. It should always be remembered that the landing speed could also have been increased on the smaller machine, and that the true comparison should take account of this.

The case for the large land aeroplane has never been stated, and there seems to be a misty idea that it is good to get a big load into one aeroplane, but it takes as much (generally more) cylinder capacity per passenger on the large machine, the insurance risk is not so well spread, and there is generally a higher first cost per seat, and more rapid obsolescence. The cost of piloting per passenger is the only adverse factor in the smaller machine, but this would not be serious until it is very small, and at the other end of the scale it is soon balanced by the rising structure weight percentage.

It is sometimes said that great aerodynamic improvements will come along as a result of research which will revolutionise air transport. There is no need to look to new discoveries, we have not yet begun to use the properties already available in aircraft.

Air transport is still new, and development takes time, but to look a little closer at possible improvement it can be said to start with that the power of the engine installed per passenger or per ton of load is not likely to diminish very much in future. The ability to lift a load depends primarily on the wing span and the power, and neither can be dodged. This is, however, of little importance beside the power used in transporting the load, which is what determines the cost of transporting it.

There will, no doubt, be a continual improvement in this. It can be seen from Fig. 1 that there are losses waiting to be diminished which are of an amount which is worth attacking. Much has been done already, but the more immediate needs lie in the direction of lower first cost, lower maintenance cost, greater comfort and more speed.

THE FLUTTER OF AEROPLANE WINGS.

[*The Flutter of Aeroplane Wings*, by R. A. Frazer, B.A., B.Sc., and W. J. Duncan, B.Sc., A.M.I.Mech.E. R. and M. 1155. With 218 pages and 60 diagrams. Published by H.M. Stationery Office, at 12s. 6d., and obtainable from THE AEROPLANE Book Department, Cannon House, Pilgrim Street, E.C.4.]

This monograph is divided into three parts, the first of which is a reprint of R. and M. 1177, *A Brief Survey of Wing Flutter with an Abstract of Design Recommendations.*

The second part of the monograph deals with the equations of motion of the wing-aileron system as well as with the criteria of stability and critical flutter speeds. A graphical treatment of the problems of binary flutter, which involves only two degrees of freedom, is also given. During the experimental investigation the authors had to develop a special technique for the measurement of the derivatives on flexible wings which were due to torsion and flexure of the wing itself and to aileron movement.

The agreement between the observed and the calculated critical speeds was found to be good enough to justify the use of the theory, as given in the monograph, for the discussion of the flutter of aeroplane wings. The value of the theory is in its application to the discovery of methods for preventing flutter.

The third part of the monograph contains various recommendations for the prevention of each type of flutter and concludes with a warning to designers of the close relation that exists between the physical and aerodynamic properties of an aeroplane wing. This may lead to sufficient precautions not being taken to prevent flutter.

SIXPENNYWORTH.

[*Definitions and Formulæ for Students (Aeronautics)*, compiled by John D. Frier, published by Sir Isaac Pitman and Sons Ltd., price 6d. Obtainable from THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, E.C.4.]

This small booklet has been compiled for students of aeronautics, by Mr. Frier, who is a lecturer at the Northampton Polytechnic Institute, London, E.C.1. There are about 200 definitions and some of the important formulæ. The definitions appear to have been written in a hurry. "Capacity" is defined as the space available for gas. "Biplane" is defined as an aeroplane with two principal supporting planes. The definition does not say that one plane must be superimposed above the other. The definition as it stands would include the tandem monoplane or to the unitiated a monoplane, for, after all, there are two main supporting planes, one on each side of the machine!

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THE ROLLS-ROYCE CONDOR III.B ENGINE.

By Lieutenant-Colonel L. F. R. Fell, D.S.O., O.B.E.

In 1917 the designs of the Series I and II Condor engines were prepared at the request of the Air Ministry to fill the demand for an engine giving a greater horse-power than that provided by the widely-used Rolls-Royce Eagle engine. Not, however, until after the Armistice could deliveries begin and in consequence the Condor Series I and II never went into Service in any considerable numbers. The Series I and II differed only with respect to the airscrew gear reduction.

As first designed the Condor was virtually a scaled-up Eagle engine, with a bore and stroke of 5.5 by 7.5 ins. But owing to the increased cylinder dimensions four valves per cylinder were necessary instead of two. An ingenious valve-mechanism was devised for this purpose, which will be explained in detail later.

The general design of crank-case, epicyclic reduction-gear, connecting-rods, pistons, and valve and auxiliary driving gear followed the principles which had been proved so highly satisfactory by War Service in the earlier Rolls-Royce engines.

The engine was rated at 525 b.h.p. at 1,650 r.p.m., with a compression ratio of 5 to 1. The total dry weight was 1,466 lbs.

On account of the enormous pressure of work on the production of motor-car chassis immediately following the Armistice no very considerable development on the engine took place, and not until 1921 was the decision made to proceed with serious work on the Condor engine.

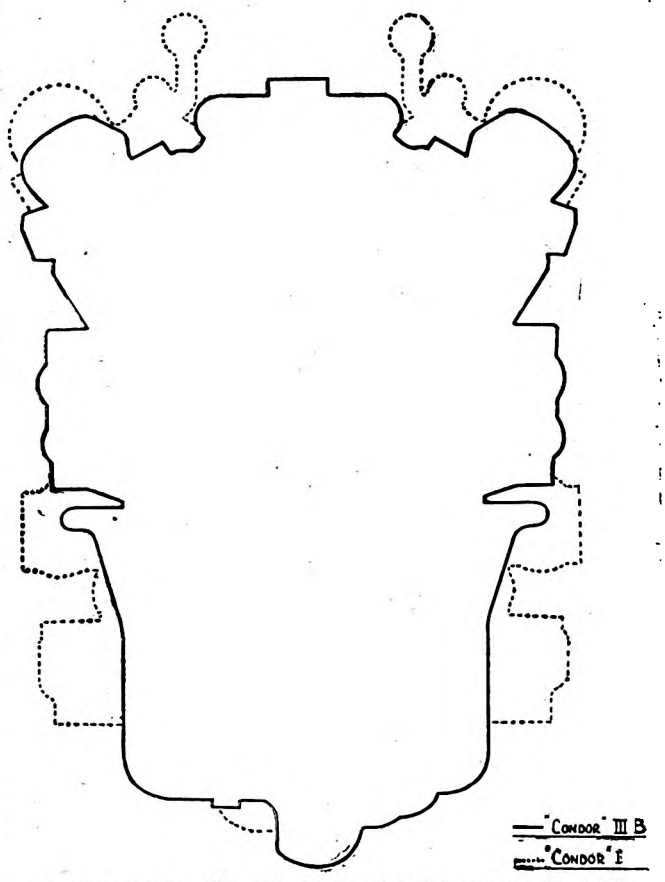
As a first step the power of the Series I engine was increased to 650 b.h.p. by advancing the speed to 1,900 r.p.m. This engine was known as the Series I.A. and it was fitted in the Fairey N.4, a four-engined flying-boat.

Owing to the lapse of time, however, it was found necessary, practically speaking, completely to redesign the Condor I so as to conform with modern requirements as regards minimum frontal area, weight and fuel consumption.

By changing the connecting-rod design from the link-rod to the marine type it was found possible to reduce the connecting-rod length and, in consequence, the overall height from the crank-shaft centre to the top of the valve-gear. The latter type of connecting-rod is the same as that now in use in the Rolls-Royce "F" and "H" engines.

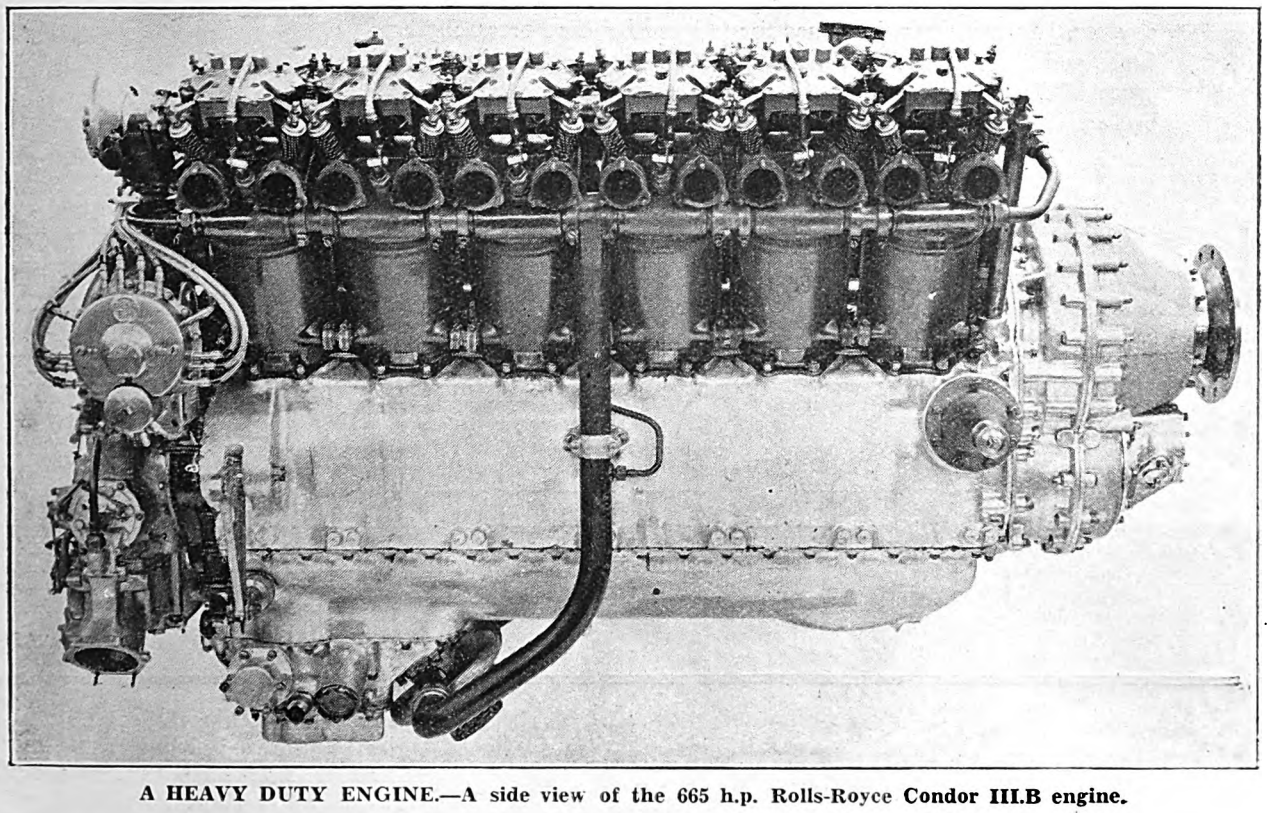
The epicyclic reduction-gear gave way to the present standard type of spur gear—now a special feature of the latest Rolls-Royce designs—introduced so as to facilitate streamlining by the aircraft builder. A general lightening of the crank-case was achieved by redesign. New carburetters and a new induction system were fitted.

The engine was then known as the Condor III and, with the same bore and stroke as the Condor I, gave 650 b.h.p. at 1,900 r.p.m. Owing, however, to the alterations in design described above, the weight was reduced to 1,340 lbs.



A comparative diagram of the frontal area of the Rolls-Royce Condor I (525 h.p.) and Condor III.B (665 h.p.) engines.

The Condor III went into small production but, owing to the very limited demand at that time for an engine of so high a power, little Service development was done upon it, and it was not until 1927 that the modified Condor III.A



A HEAVY DUTY ENGINE.—A side view of the 665 h.p. Rolls-Royce Condor III.B engine.

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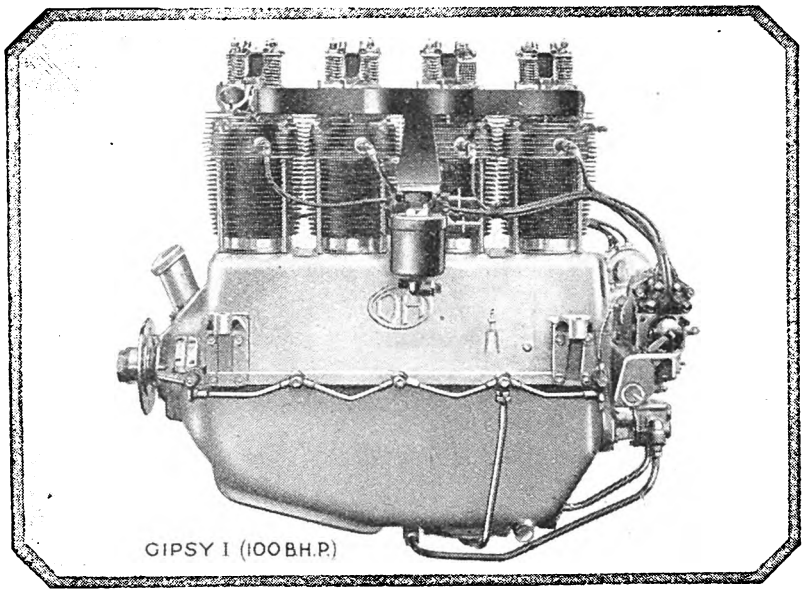
The GIPSY


GIPSY I (100 B.H.P.)

GIPSY I

Since its introduction two years ago as the first of the Gipsy series, the GIPSY I engine has gone from triumph to triumph in open competition, winning the race for the King's Cup on its first public appearance, and gaining more first places and fastest times in speed events than any other light aero engine in the world. Its 600 hours in the air under seal and its unfaltering service in the hands of amateur, professional and service pilots have earned for it a jealously guarded reputation for dependability and long life in every-day use. In the Moth, it is used for training by Air Forces, Flying Clubs and Schools the world over, and it is fitted, besides, in fifteen types of light aircraft other than the Moth. Its universal use is backed by universal service. IMMEDIATE DELIVERY.

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perfect results throughout its
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the crankshaft line makes po
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occupants of the cabin, besides
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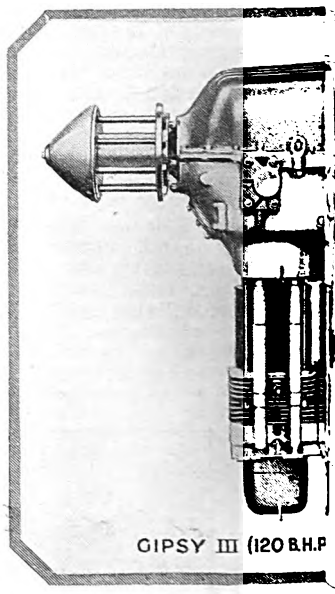
GIPSY III (120 B.H.P

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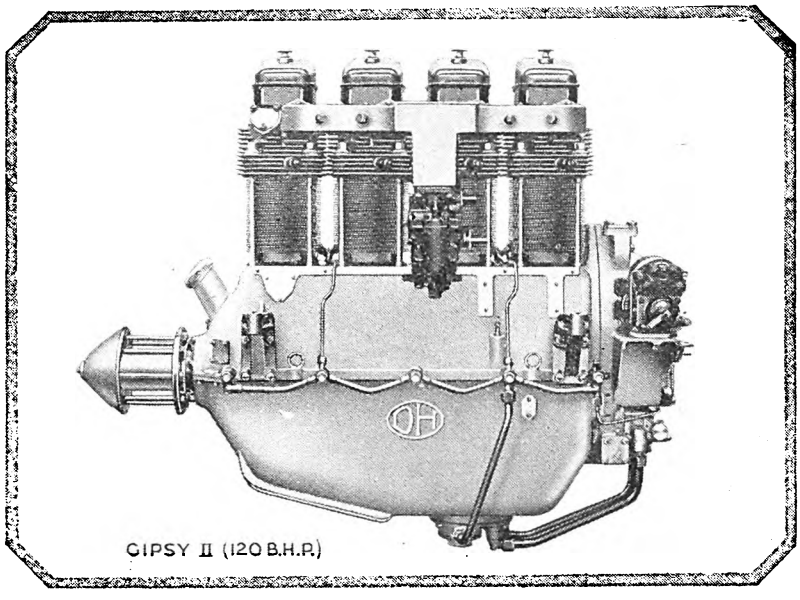
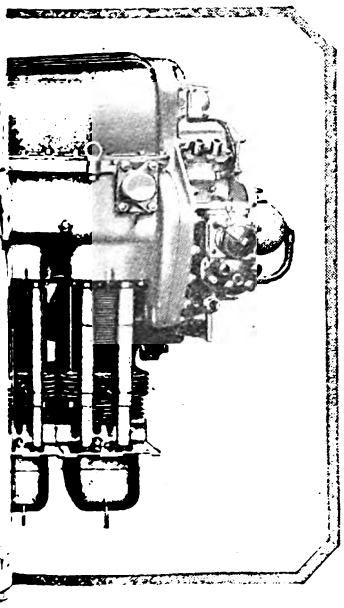
RANGE

II

iverted edition of the Gipsy II. sump type, which has given trials in the air and on the test l engine in a light aircraft has type—its decreased height above otally unrestricted view ahead, of the engine is inaudible to the self to the leading of the exhaust by completely eliminating fumes to a bare minimum. Universal





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A direct development of the Gipsy I, the GIPSY II engine has been produced to satisfy the demand for an engine of the Gipsy type with that extra power required for operation in special circumstances, such as exceptionally high altitudes, and where a specially quick take-off and rapid rate of climb are essential. By virtue of its development, the same degree of reliability is assured as with the Gipsy I, the higher power output being obtained by an increased capacity with consequent strengthening of all components called upon to withstand higher stresses. The Gipsy II embodies an all-enclosed valve gear running in oil, steel cylinders and many other features of latest practice. Universal service. EARLY DELIVERY.

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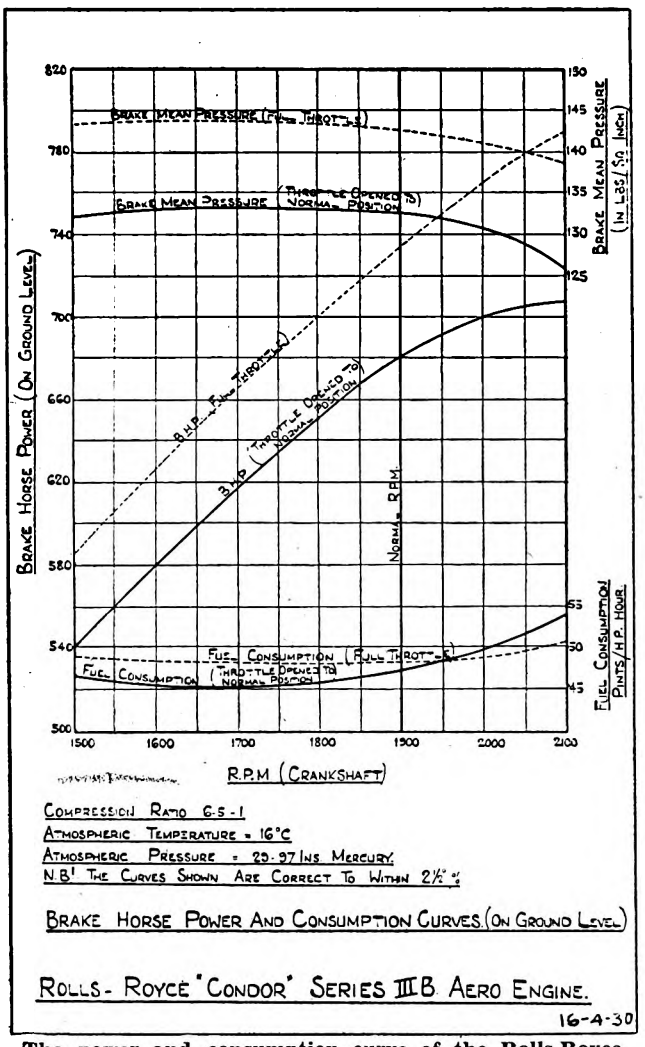


The power and consumption curve of the Rolls-Royce Condor III.B engine.

came into general use in well-known types of aircraft, such as the Hawker Horsley torpedo-carriers, in which aircraft the engines have been outstandingly successful.

The alterations introduced in the Series III.A were chiefly connected with the main-bearing design and materials, the lubrication system, and increase of compression ratio to 6.5 to 1.

In 1928 Rolls-Royce Ltd. decided to bring the Condor engine into line with the latest Rolls-Royce practice as regards crank-case design, and this engine, known as the Condor III.B, is described hereafter.

It is now being produced for a further squadron of Hawker Horsley machines for the Royal Air Force, and it is also used in the Blackburn Iris three-engined flying-boat. In addition, the airship R.100 has recently been equipped with this latest design.

As the earlier series of Condor engines have already been described in The Aeroplane the main points where the Series III.B departs from the earlier practice will alone be dealt with in detail.

Leading Particulars of the Condor III.B.

Number of cylinders	12
Bore	5¼ ins.
Stroke	7½ ins.
Compression Ratio	6.5 to 1
Normal b.h.p. (at ground level) (maintained up to altitude of 3,000 ft.)	665
Normal Speed (Crank-shaft)	1,900 r.p.m.
Maximum Speed (Crank-shaft)	2,100 r.p.m.
Normal Speed (Airscrew)	907 r.p.m.
Gear Ratio	.477
Fuel Consumption at normal power and speed	41 gals. per hr.
Oil Consumption	1.3 gals. per hr.
Weight of Engine, including carburetters, magnetos, engine feet, distributor and pipes for power starter, etc., but excluding reduction gear, exhaust boxes, radiator, airscrew, oil, fuel and water	1,409 lbs.

Cylinders.

Each cylinder, with its water jacket, forms a separate unit. The cylinder barrel is machined from a steel forging and has formed around its lower end a holding-down flange drilled to take the holding-down studs.

The inlet and exhaust ports are machined from solid forgings welded in the opposite sides of the head. The water jacket is made from steel pressings welded into place. There are two inlet and two exhaust valves to each cylinder.

Valves and Valve-operating Mechanism.

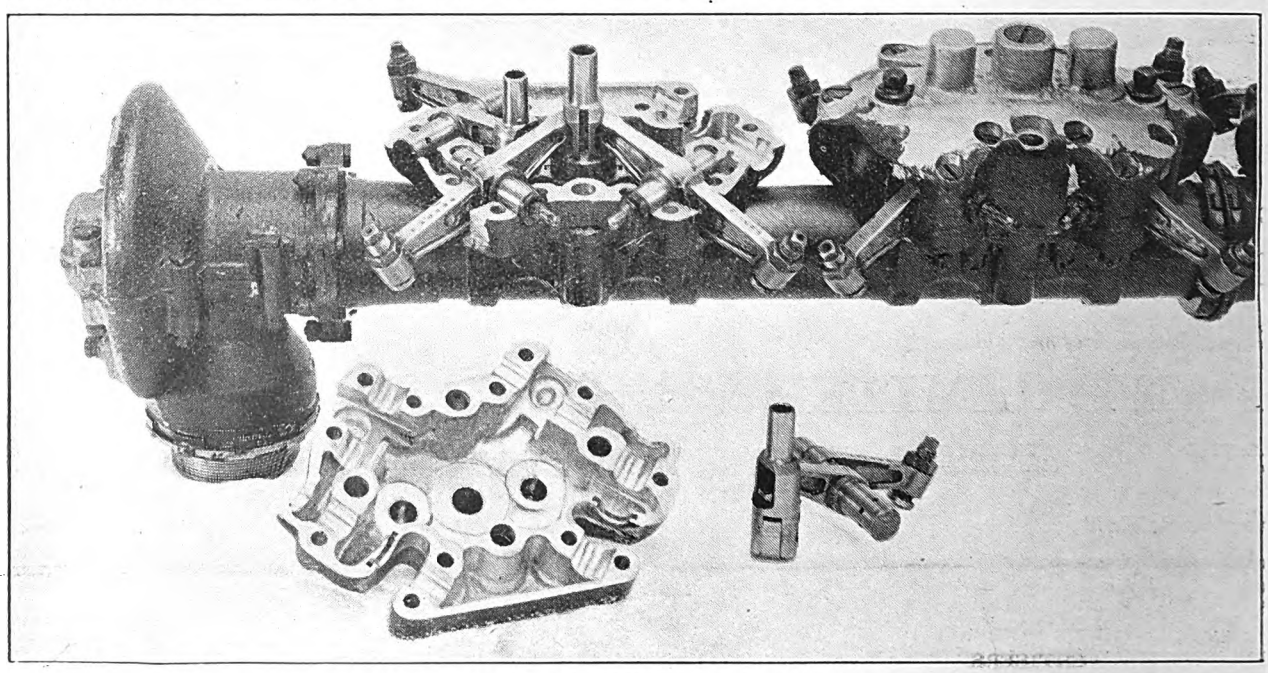
One cam-shaft per line of 6 cylinders operates all valves. For each cylinder there are three cams. The central cam controls two rocker-arms; the two outer cams one valve each.

As the cylinder-heads are spherical and the valve-seats are directly in the head, the valve-stems are divergent. The valve-rockers must swing in a plane parallel to one which contains the valve-axis and this plane cannot be at right angles to the cam-shaft axis. Any attempt to operate the valve-rockers directly, or through rollers rigidly attached to the rockers, would, therefore, lead to lateral loads on the rocker-arms.

This difficulty is overcome by interposing between the cams and the rockers cylindrical tappets running in vertical guides from the cam-shaft casing-boxes. These tappets are slotted at the appropriate angle for the rocker-arm, and the end of the rocker-arm projects into the slot and is driven from the hardened face at the bottom of the slot.

Cam-shaft and Auxiliary Driving Gear.

The drive for the cam-shaft and for all auxiliaries is taken from a spur wheel at the rear end of the crank-shaft. This pinion is, as in the Rolls-Royce Eagle, fitted with the



The valve-gear as used on all Rolls-Royce Condor engines.

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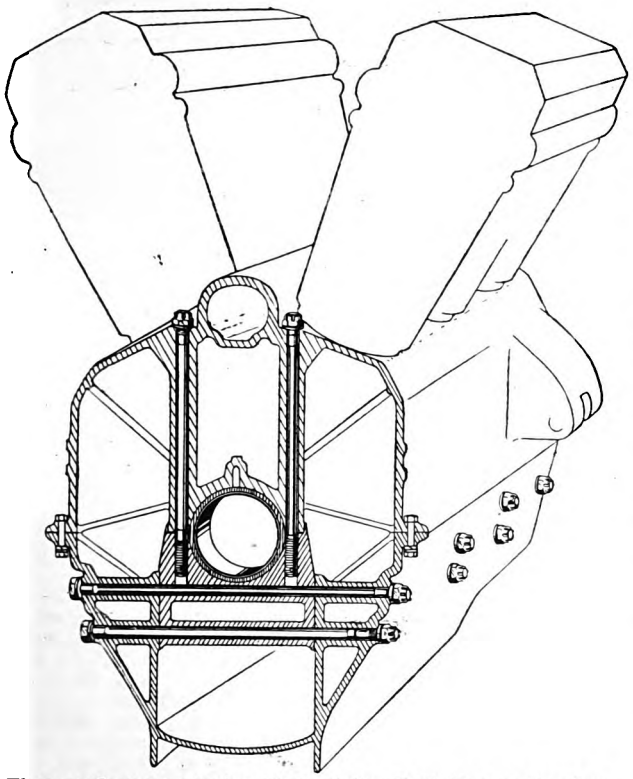


The crank-case construction of the Rolls-Royce Condor III.B engine.

R.R. friction-damped spring-drive, designed to relieve the whole of the gear from any stresses that might be set up by crank-shaft vibration.

PISTONS AND GUDGEON-PINS.

The pistons are made from forged aluminium alloy machined all over. Three compression-rings and one oil-scraper-ring are fitted. Stops are provided to prevent the rings from rotating.

The gudgeon-pins are hollow, hardened and ground and made from silicon manganese steel. They are of the full floating type, and axial movement is limited by circlip rings at the end.

CONNECTING-RODS.

As already stated, the connecting-rods are of the forked type. They are of H section, machined all over. The big-end of the forked rod consists of a mild steel block split longitudinally and lined with white metal internally. A white-metal bearing surface is also provided over the outside of the central portion on which the big-end of the blade-rod works.

CRANK-SHAFT.

In the Series III.B the diameter of the crank-shaft journals has been increased from 3 in. in Series III.A to 3.5 in. in Series III.B. The width of these bearings has also been increased by .2 in. While advantageously increasing the rigidity of the crank-shaft this alteration also has the effect of increasing the period of life of the main bearings.

CRANK-CASE.

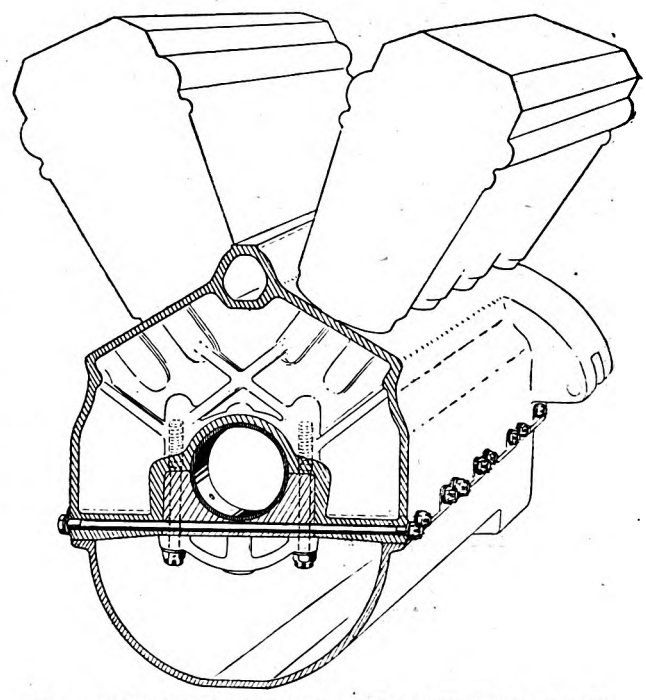
The type of crank-case in use on the Series III.B differs fundamentally from the design employed in the Series III and III.A.

Though the three-point suspension bearers are still retained so as to make the engine interchangeable as regards installation with the earlier series, the new crank-case is otherwise entirely different. It will be noticed that, whereas in the Series III engine the joint of the top and bottom halves is along the centre-line of the crank-shaft, in the Series III.B the joint is now below the crank-shaft, and the caps of the bearings are fitted in the upper section of the crank-case instead of, as in the Series III, in the lower section.

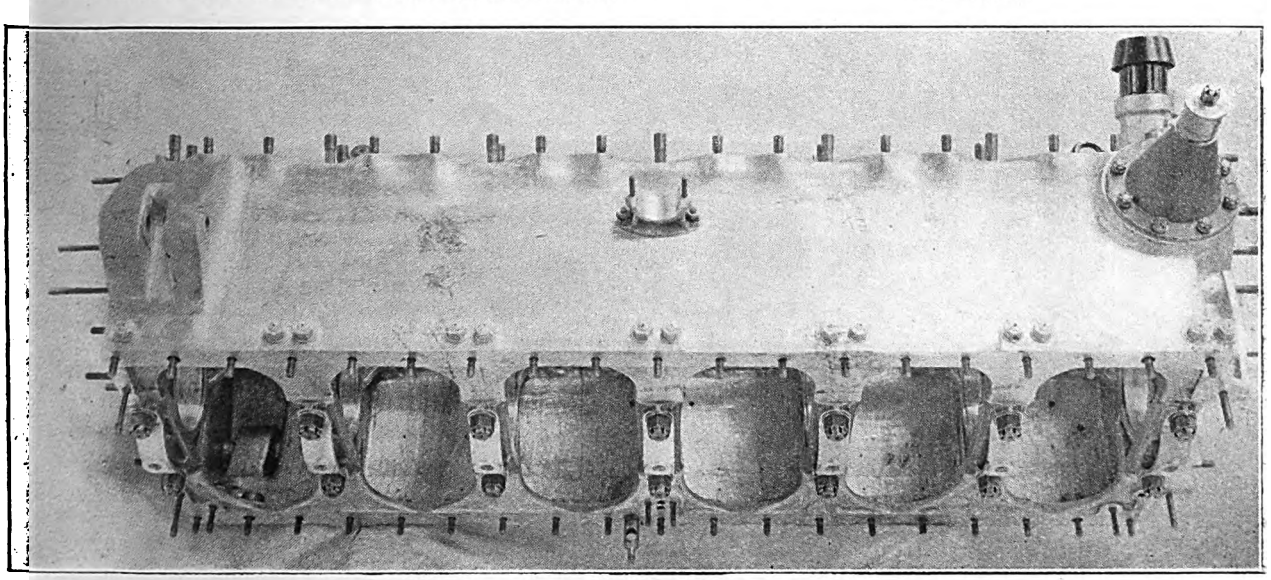
Obviously this removes all the main stresses from the lower section and ensures that torsional strains are not taken through the joint between the upper and lower sections. The new design provides a crank-case with the rigidity of an unsplit type without introducing the difficulties experienced with the latter when fitting the crank-shaft. At the same time the lower section of the crank-case can readily be removed for inspection and cleaning without disturbing the crank-shaft.

REDUCTION GEAR.

This has already been described in THE AEROPLANE and is of the same type as that used on the Rolls-Royce "F" and "H" engines, with the exception that a flange mount-



The crank-case construction of the Rolls-Royce Condor III engine.



The crank-case of the Rolls-Royce Condor III.B engine.

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ing for the airscrew is provided in place of a shaft mounting.

OIL CIRCULATION.

The usual Rolls-Royce system of using two oil pressures is used in the Series III.B. These two pressures are obtained by the use of a compound relief-valve fitted on the outlet side of the pressure-pump. This arrangement permits of a high pressure being used for the crank-shaft bearings where it is essential. At the same time it ensures that such parts as cam-shaft bearings are supplied only with what is necessary at low pressure. Thus it ensures that the circulation of oil through the engine is cut down to the minimum.

This is of the greatest importance in reducing the heat given up to the oil to a low figure. The value of this feature will be appreciated by those who have experienced the difficulties encountered in providing adequate oil-cooling devices in aircraft installation.

STARTING DEVICES.

The Condor III.B can be fitted with a hand-turning gear, if desired. All engines are, however, equipped with a petrol-gas starter-distributor, together with the necessary pipes and cylinder non-return valves normally employed in connection with the various air, or vapour, starting devices.

PETROL PUMP.

As with the "F" and "H" engines, a petrol pump of the gear type is fitted to the Condor III.B.

CARBURETTER.

As will be seen from the power and consumption curves the Condor III.B engine is one of the most economical engines in existence. This, while largely due to the excellence of the form of the combustion chamber, which permits of high compression, is also in a large measure due to the Rolls-Royce design of carburetter.

This carburetter is provided with twin choke-tubes, and the jets are of the submerged type delivering into the air stream through diffusers. Control of the mixture strength to suit different altitudes is effected by hand by means of a conical valve arranged in the fuel-passage from the float-chamber to each jet. An extra air valve is incorporated in the throttle so as to ensure maximum economy when flying under throttled conditions, and the success which this and the other features have achieved is, as stated above, very evident.

THE PACKARD DIESEL ENGINE.

Much has been heard of late about the Packard Diesel Engine, photographs of which have already appeared in THE AEROPLANE. The Packard Motor Car Company of Detroit, the manufacturers of this engine, have said little about their latest product until recently when Mr. L. M. Woolson, the aeronautical and research engineer, of the Company, read a paper describing the engine before a meeting of the American Society of Automotive Engineers at Detroit. The Packard Diesel is now being put on the market and several types of American aeroplanes can now be bought with this engine.

[Since this article was written Mr. Woolson has been killed in an aeroplane accident in the United States.—ED.]

For a long time there has been a general feeling throughout the Aeronautical World that sooner or later an internal combustion engine of the compression-ignition type must be produced for aircraft, and engine designers all over the World have been working hard at the problem. But the Packard Company must be given the credit for being the first to put such an engine on the market.

Mr. Woolson opens his paper by giving the dimensions, weight and power of the Packard Diesel Engine which is of the radial air-cooled type. The engine has nine cylinders with a bore of 4-13/16 in. and stroke of 6 in. This gives a displacement of 980 cub. in. (nearly). The engine is rated at 225 h.p. at 1,950 r.p.m., and weighs 510 lbs.

The paper then outlines the differences between the Diesel and Otto-cycle systems of operation. It lays stress on the fact that the Diesel or compression-ignition system, in which the air is first compressed with a consequent rise in temperature, so that when the fuel is injected and mixed with the heated air it fires, dispenses with the complicated and trouble-making electrical ignition system which is necessary to the normal petrol engine.

There are three outstanding features in the design of a successful compression-ignition engine for use in aircraft and in the first part of his paper Mr. Woolson describes how these three features affected the design of the engine. First the compression-ignition engine must withstand maximum cylinder pressures two or three times as great as those generally present in normal petrol aircraft engines. The compression ratio in this engine is about 16 to 1.

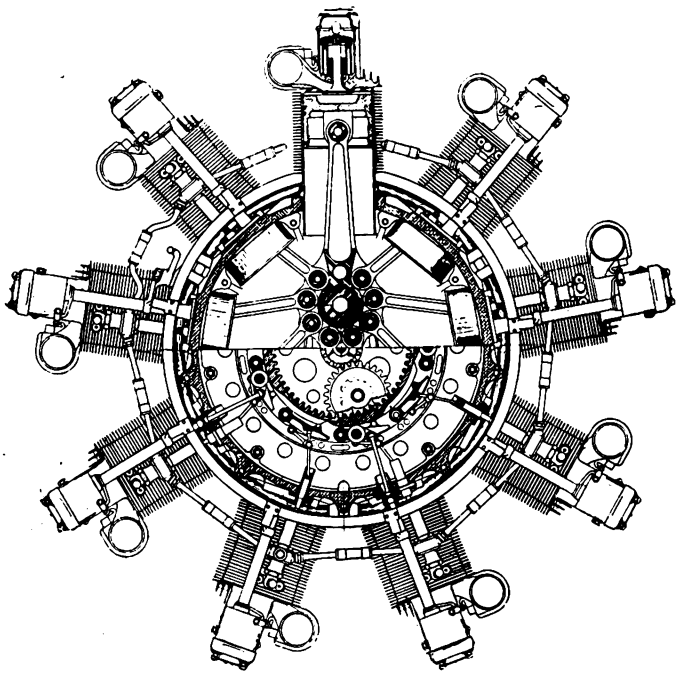
Secondly there must be a high degree of turbulence in the cylinder so that all the fuel shall combine with the oxygen present, in the extremely short time available for combustion. In the ordinary petrol engine the fuel is well mixed with the air all the way from the carburettor right through the induction system. In the Diesel engine the fuel has to be correctly and thoroughly mixed with air in the cylinder during combustion.

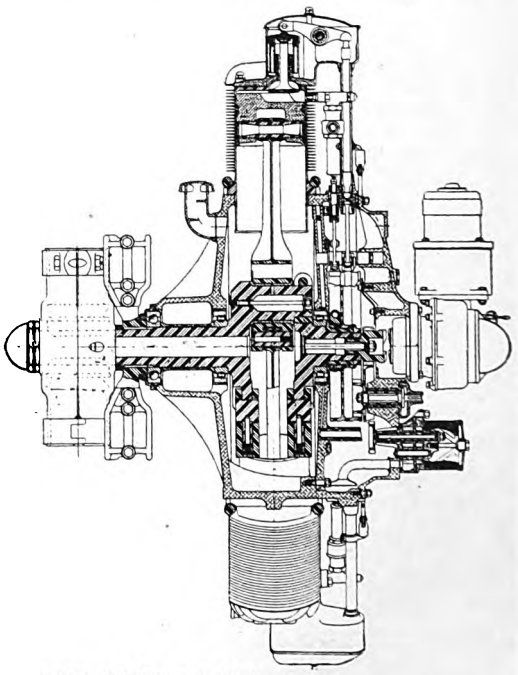
Thirdly the fuel pumps and nozzles have to be designed to work over a much wider range of speed than had been previously practicable with Diesel engines.

The first feature of very high maximum cylinder pressure makes the attainment of a good power-weight ratio a difficult proposition. Its high weight-power ratio has been the outstanding reason against the use of Diesel engines in aircraft. Various novelties in design and the addition of much simplification have enabled the Packard Diesel to show a weight-power ratio of 2¼ lbs. per h.p.

CYLINDER FIXING.

The crank-case weighs 34 lbs. and is in one piece. The usual method of attaching the cylinders of an air-cooled radial engine to the crank-case is by studs screwed into the crank-case flange. These studs project through the cylinder





A RADIAL DIESEL.—Sectional drawings of the 225 h.p. Packard-Diesel radial engine.

(By Courtesy of the Journal of the Society of Automotive Engineers.)

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flange against which the retaining nuts seat. As the light alloys which are used in crankcase construction have poor qualities of resistance to the shock loading which is characteristic of Diesel engines, this usual method of cylinder attachment would make necessary the use of a very heavy crankcase.

In the Packard engine two circular hoops of alloy-steel encircle the cylinder flanges in contact with the crankcase at front and rear of the engine. These hoops are contracted by turn-buckles and so an initial stress is given to these hoops which far exceeds the working stress set up by the explosions in the cylinder.

Thus the crankcase is given an initial compression which it is well adapted to resist. When the engine is running these stresses are substantially reduced and at no time can tension loads be transferred from the cylinders to the crankcase.

Inertia Stresses.

Mr. Woolson says that the arrangements whereby the crankshaft and airscrew are protected from excessively high stresses are equally as important as is the construction which enables the crankcase to withstand extremely heavy loads. The maximum cylinder-pressures are more than ten times as great as are the average cylinder-pressures in petrol engines during the working stroke. Means have been taken to cushion the major parts of the engine from such high shock loading, and advantage is taken of the fact that the peak-pressures exist for a very short time in each cycle.

The counterweights of the crankshaft and the airscrew are both flexibly mounted on the crankshaft and so a cushioning effect is interposed between the crankshaft and those parts which have a maximum flywheel effect. Thus the stresses in the crankshaft are greatly reduced and thus it can be built for a weight not substantially different from that of a crankshaft designed for a petrol engine.

The counterweights instead of being rigidly bolted to the cheeks of the cranks are pivoted on them and are located between powerful compression springs. When the crankshaft is suddenly accelerated the weights lag slightly behind and the peak-pressure has passed before the weights are solidly driven again.

For the same reason the hub of the airscrew floats on an extension of the crankshaft. The driving effort is supplied by a two-armed driving member splined to the crankshaft. The driving member transmits the effort through lugs which are integral parts of rings clamped to the blades of the airscrew. The driving member has two rubber blocks to each arm between which each driving lug is confined.

The high degree of turbulence required in the engine has been obtained by shaping the inlet port, which is placed to one side of the head, as a flattened venturi, and arranging it tangentially to the bore of the cylinder. This gives the incoming air an extremely rapid whirling motion. At high engine-speeds the circulation of the air in the cylinder permits of one revolution of the mass of air round the circumference of the bore in the time available for combustion, say .004 sec. at 1,800 r.p.m.

Each cylinder of the Packard Diesel has a combined nozzle and fuel-pump unit. This arrangement avoids the troubles that are likely to arise with a multiple pump placed somewhere remote from the cylinder-heads and connected to them by comparatively long capillary tubing. Such an arrangement is likely to have trouble from surges of pressure and the trapping of air.

After these explanations Mr. Woolson details the construction of the engine.

Construction.

The crank-case is a one-piece magnesium-alloy casting of rather large diameter, into the front face of which is forced a forged steel container. This has, at the front end a deep-grooved ball-bearing which takes both the airscrew thrust and the radial load at this point. At the rear of this container and immediately in front of the forward crank is a roller-bearing.

The crank-shaft is of the normal split type but has, as already explained, specially pivoted counterweights. The after part of the crank-shaft is also carried in a roller bearing. This is supported by the diaphragm, which is immediately in line with the rear cylinder retaining-hoop in the same way as the front of the crank-case is immediately in line with the front retaining hoop. Behind the diaphragm are the gears for driving the valve gear and accessories. There is a rear cover casting which carries the oil and fuel circulating pumps, the starter, the generator and tachometer drives. The engine-mounting bolts engage integral bosses on the main crank-case casting.

The connecting-rod assembly is conventional, with a master rod and eight connecting-rods linked thereto by wrist pins.

Valve and Pump Gears.

The valve-gear and fuel-pump mechanism are placed at the back of the engine and driven by two separate cam-rings, each of which has four lobes and each of which is driven at one-eighth engine speed in the direction opposite to that of the rotation of the crank-shaft. The cams have an internal gear which meshes through idler gears with the crank-shaft. The valves and fuel-pumps, of which there are one of each to each cylinder, are driven through rockers which make rolling contact with the cams. These rockers are mounted in pairs on a common shaft and make contact with plungers which move in forged duralumin guides. These are bolted to finished surfaces on the outside of the crank-case.

The inner ends of the valve push-rods seat in hemispherical recesses in the rockers. The inner ends of the push-rods for the fuel pumps fit in specially shaped grooves in their rockers. The latter push-rods are connected through a link-gear with a ring which slides in a groove in the diaphragm and can be rotated by the pilot. Movement of this ring will affect the length of stroke of the fuel pump because the inner end of the push-rod can be moved thereby along the groove in the rocker. The outer end of the rod is held in contact with the plunger.

The lubricating-oil pump is mounted on the rear cover and is driven by spur gear off the cam idler-gear.

Cylinders.

The cylinders weigh 11¾ lbs. each and are of simple design. The cylinder head proper is formed integral with the cylinder barrel. As only air is drawn into the cylinder on the intake stroke a single valve can be used for both exhaust and inlet purposes. This contributes to the lightness of the cylinder as the cylinder is only weakened by one port. Because there is only one port this can be large. This not only assures a full volume of air to the cylinder, but also offers but little resistance to the speeded-up air-flow caused by the venturi construction of the inlet which has been already mentioned.

The cylinder heads are light aluminium-alloy castings which support the overhead valve-mechanism and valve-stem guides. They also incorporate inlet and exhaust ports.

Valves.

The mechanism outside the crank-case for operating the valves is of the normal ball-ended push-rod and rocker type. The rocker arms are mounted on roller bearings and oscillate on eccentrically mounted shafts. The adjustment of valve-tappet clearance is obtained by rotating the eccentric shaft.

Each valve has twelve valve-springs of the multiple type already developed by Packards. This arrangement has twelve spindles which are placed at equal distance from, and parallel to, the valve stem. On these spindles are placed the springs. The idea is to eliminate the probability of failure and to assure the greatest possible security from failure of individual valve-springs. Also the small size of valve-spring wire has physical properties superior to those of the larger sizes used with the more conventional forms of valve-spring.

Pistons.

The pistons are made of aluminium alloy and are of more or less conventional design. They have, however, an eccentrically located pocket in the head which with the design of the inlet valve is responsible for the high degree of turbulence.

There are three rings to each piston. Two compression rings above the gudgeon-pin and one below. The gudgeon-pin is fully floating.

Fuel Injection.

The fuel-pump and nozzle assembly is a detachable and interchangeable unit which is bolted to a flange on the rear of the cylinder by two set-screws. The circulating fuel-pump supplies fuel at low pressure to these units. The fuel-pump body is an alloy steel forging with a bronze cylinder pressed into it.

The pump-plunger is made of heat-treated steel and has a mushroom head which engages in a T-slot in a cross-head. This is moved by the tappet. The pump-plunger is returned by a compression spring which surrounds the cylinder of the pump.

The fuel passes a fine-mesh screen before it enters the ports of the pump. Between the pump and the nozzle is a ball-valve which prevents any gases from the combustion-chamber entering the pump.

The body of the nozzle is also an alloy-steel forging which is screwed to the body of the fuel-pump. The flange with which the unit is attached to the cylinder is an integral part of the body of the nozzle.

The nozzle itself is an independent unit which is screwed into the nozzle body. The orifice is flared and into it seats a small poppet valve with a compression spring which is arranged to hold the valve, not against the nozzle, but an independent adjustable stop-screw. This valve is adjusted to be off its seat a few thousandths of an inch. This ensures atomisation and entire freedom from the formation of carbon. It also ensures the prompt emission from the system of any air that may have become trapped in the fuel.

Each cylinder has an air-inlet pipe. For slow running this can be closed, and the requisite air is then drawn through the exhaust pipe. For starting in very cold weather electrically-heated incandescent-elements are fitted to each cylinder.

Lubrication is on the dry-sump principle and all bearings are positively lubricated except the anti-friction bearings, gudgeon-pin bushings and cylinder walls, which are lubricated by splash in the usual way.

The bearings of the external valve-rocker arms are lubricated when necessary by a grease gun.

Operation.

Mr. Woolson then outlines the operation of the engine. The single valve opens during the exhaust stroke and remains open as the piston travels down from top dead-centre. Fresh air is thus drawn in through the intake, which is in the slipstream of the airscrew. Shortly after bottom dead-centre the valve closes and the air is compressed to about 500 lbs. per sq. in. Its temperature is then raised to about 1,000 deg. F.

About 45 deg. before top dead-centre the fuel-pump tappet starts to rise and the plunger of the pump is thus forced upward. As soon as the plunger of the pump has passed the inlet port the fuel trapped in the pump is compressed and forced through the nozzle in a fine spray. As soon as this spray mixes with the super-heated air combustion begins.

The amount of fuel injected depends upon the length of

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the stroke of the plunger above the position when the inlet valve is closed by the passage of the plunger. This amount of stroke is determined by the position of the push-rod of the fuel-pump in the slotted rocker-arm. As has already been explained this position can be moved by rotating a ring controlled from the cockpit.

The injection of fuel continues until the piston is nearly at top dead-centre, thus the pressure in the cylinder is allowed to rise comparatively slowly until the maximum pressure is reached. At wide-open throttle this is about 1,200 lbs. per sq. in.

When the piston passes top dead-centre the gases expand in the cylinder until the valve opens at approximately 45 deg. before the piston reaches bottom dead-centre. The products of combustion are then forced out through the valve and through the exhaust mainfold which is connected to the rear opening of the combined inlet- and exhaust-port in the cylinder-head.

With the normal type of inertia-starter practically instantaneous starting is possible at all times. The throttle is held wide open while the engine is being cranked and no choking nor priming is required. The engine starts on its regular supply of fuel oil. In cold weather at really low temperatures the glow plugs or heating elements must be used.

The engine is stopped by closing the throttle against a spring stop. This movement so reduces the travel of the pump plungers that no fuel is forced into the cylinders.

The fuel generally used for this engine and found highly satisfactory is domestic furnace oil which costs about nine cents (4½d.) per gallon. This particular grade of fuel oil is a refined product which has a gravity of 37 deg. Baumé or a specific gravity of about .84. It is almost entirely free from dirt and impurities and is well suited for aviation use. The pour-point is so low that it will flow readily under any conditions so far encountered in experimental flying such as —20 deg. F.

FLYING TESTS.

A Stinson Detroiter six-seat cabin monoplane and a Waco three-seat open cockpit biplane have each been fitted with a Packard Diesel engine. Each has climbed to well over 18,000 feet with the engine behaving in a normal fashion. No special equipment of any kind was used.

In the normal way when an aeroplane with a petrol engine is climbing, the engine revolutions will decrease. This can be remedied to a certain extent by using the altitude adjustment and making the mixture poorer. Nevertheless, for any fixed position of the throttle, engine speed decreases with increase of altitude. With the Diesel engine however if after taking off the throttle was closed to the cruising position, as the machine climbed so the engine speed increased.

Mr. Woolson summarises the advantages claimed for the Packard Diesel Engine under the headings of reliability, fire risk, reduced fuel consumption, reduction of fuel costs, operation not affected by temperature and the elimination of radio interference.

He claims that the engine is inherently far more reliable than the petrol engine because firstly there is no electrical ignition system and secondly each cylinder has its own fuel system. Failure of any fuel pump would not affect the other cylinders.

At no time has the starting of a fire been possible with this fuel under conditions which simulate the result of a crash or an accidental breakage of the fuel line in the air. The accidental ignition of the fuel oil has proved impossible during thousands of hours of testing the engine on the ground and in the air.

Mr. Woolson says that a conservative estimate of the weight saved by the reduction in the consumption of fuel is 20 per cent. by weight and 30 per cent. by volume. There is also a considerable reduction in the fuel-costs, both because less is used and because the fuel is much cheaper than petrol.

The Diesel engine is not affected by either abnormally high or abnormally low air-temperatures, as is the case with the petrol-engine. The latter has a tendency either to pre-ignite or deteriorate under the first condition, and under the second the carburettor tends to form ice and choke.

Finally the absence of electrical ignition removes the source of that interference which is such a nuisance to wirelessly-equipped aircraft. An extensive system of shielding is necessary to prevent such interference on aircraft with the normal petrol engine. Mr. Woolson says that such shielding reduces the efficiency of the normal ignition system and renders it far more liable to failure.

A NEW VICKERS COMMERCIAL AEROPLANE.

Vickers (Aviation) Ltd. are completing a very interesting commercial monoplane of high performance which is to be known as the Vickers Viastra.

This machine is a high-wing braced monoplane of all-metal construction and is designed to be fitted with either a single Bristol Jupiter, two Armstrong Siddeley Jaguars, or three Armstrong Siddeley Mongoose engines. The Jaguar-Major or the Cheetah can also be fitted.

The fuselage has accommodation for two pilots, seated side-by-side ahead of the leading edge of the wing in an enclosed cockpit, and twelve passengers in a cabin to which special attention has been given to provide as noiseless and well-ventilated passenger accommodation as possible.

Aft of the cabin is a lavatory, and two baggage compartments of 100 cub. ft. total capacity are provided. Should the machine be required for freight carrying purposes the passenger seats may be easily removed.

The undercarriage is of the divided type with very wide track. The wheels are provided with hydraulically-operated wheel-brakes and the tail is supported on the ground by an oleo-sprung castor tail wheel.

In the two- and three-engined versions the wing engines are mounted below the wings at the extremities of the wing bracing struts and drive tractor airscrews.

The pay-load of the Viastra varies according to the power-plant from 2,050 lbs. to 2,460 lbs. as a landplane, and from 1,160 lbs. to 1,530 lbs. as a seaplane. The top speed at sea level varies from 131 to 167 m.p.h., and the cruising speed from 115 to 147 m.p.h., according to the engines fitted.

The best maximum speed is got with the Armstrong Siddeley Jaguar-Major engines, but with three Armstrong Siddeley Cheetah (or double-Mongoose) engines this speed is only reduced by two miles per hour on a range of 300 miles.

A NEW LINE OF RESEARCH.

Those who remember Dr. A. P. Thurston, now a well-known patent agent, as one of the pioneers of aeronautical science in the very earliest days of flying will also remember some interesting experiments which he made with birds' wings, particularly in relation to the study of the alula, a kind of thumb on a bird's wing which seems to have an effect somewhat similar to that of the Handley Page slot. During the War Dr. Thurston was in the technical branch of the R.F.C. and R.A.F., and had a good deal to do with the developing of steel construction.

Since he has had more time to himself Dr. Thurston has been engaged in trying to discover whether some still better means of controlling aeroplanes and of increasing the lift of aerofoils can be evolved than anything known at present. One hopes before long to be able to give more detailed particulars of Dr. Thurston's investigations.

All that can be said at present is that he has evolved a member which is disposed at or near the leading edge of a plane which member normally lies flat along the leading edge but automatically swings clear and allows a rotating device to come into operation when the angle of incidence becomes excessive,—very much as a slot opens and becomes effective when the machine is on the verge of stalling.

According to Dr. Thurston's experiments if his rotor "thumb," or rider-plane, is mounted so as to turn on an axis transverse to the leading edge, the stalling angle may be delayed as much as 20 degrees and the maximum lift may be very much increased. The principle involved is highly ingenious, and really seems quite simple. So further experiments will be awaited with considerable interest.

MAGNETO SETTING ON JUPITER ENGINES.

Bench and flying tests have shown that by altering the standard magneto setting on Jupiter engines, except Series IV, the smoothness of running may be improved, the cylinder temperature lowered and the liability to detonate decreased.

Air Ministry Notice to Aircraft Owners and Ground Engineers No. 10 of 1930 draws attention to this alteration and says the standard setting of 42 deg. is altered to one of 35 deg. before top dead-centre. These readings are taken with the contact-breaker in the fully advanced position.

TECHNICAL EQUIPMENT.

[*The Technical Report of the Aeronautical Research Committee*, 1928-29, in two volumes, price £1 12s. 6d. and £1 10s. each respectively. Published by H.M. Stationery Office and obtainable from THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, E.C.4.]

The first volume contains the Report of the Aeronautical Research Committee for the year 1928-29 which was reviewed in THE AEROPLANE for Sept. 25, 1929. The rest of the volume contains all the reports and memoranda relating to Aerodynamics which have been published during the year.

The second volume contains the R. and M.'s, dealing with Control, Stability Slots and Pilot Planes, Spinning, Strength of Construction Materials, Engines and General, which have been published during the year.

These volumes provide the best method for filing the technical information issued by the Aeronautical Research Committee during the year, in the form of R. and M.'s. The volumes have an index so that the necessary reports can be easily found. Naturally they will find their way into every aeronautical reference library. They should also be part of the technical equipment of every aircraft design office.

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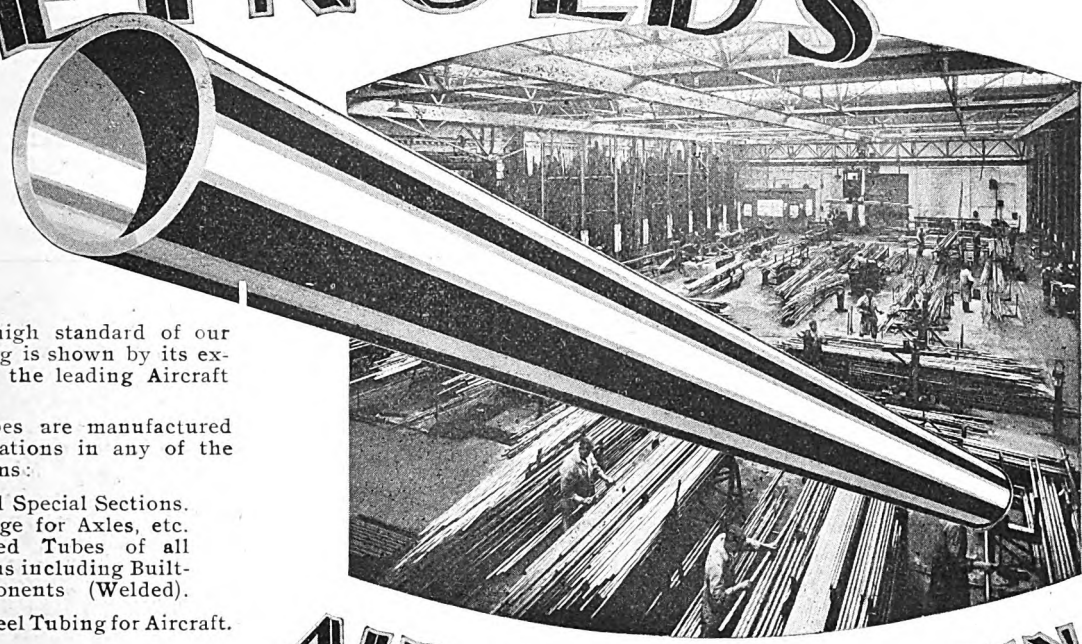

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

THE HESTON EASTER TOUR.

[By a Special Correspondent.]

Vienna, April 23, '30.

Here we all are in Vienna, the Heston Spring Tour, having a splendid time, but I think I had better begin at the beginning, or I shall get all mixed up and be sure and forget some of our doings!

As you know, 20 light aeroplanes started off from Heston on April 17, and 20 light aeroplanes all got to Douai in time for lunch. Not bad going for the first day.

We had a good flight across the Channel. We only took 12 minutes, as there was a following wind.

Lympne were splendid about signalling us out, but Calais didn't rise to the occasion nearly so well, and though lots of people seemed to be running about in lots of directions we couldn't get a clear signal, though we circled round and round for about five minutes. We did our duty, however, and decided it was *their* pidgin if they hadn't seen us.

Once over France the weather became perfectly beastly. Bumps—hail—sleet, etc. But when we got to Douai all our woes were soon forgotten in the warmth of the reception awaiting us.

We were received most cordially by M. Jacques Bréguet, as president of the Aero Club of the North of France, and a number of other kind friends, and were taken to a large hangar, which was beautifully decorated with French and English flags. There we found tables groaning under the weight of champagne, and were toasted and welcomed in French and English by people we know and people we didn't know, until we felt quite overwhelmed. M. Bréguet then made a really delightful little speech in English, and to the great relief and gratitude of the whole party Mr. Nigel Norman responded in French with what was evidently an equally good one, to judge by the applause.

After this we expected to continue the journey to Brussels, but were told that this reception was only a curtain-raiser to the main event, which turned out to be a luncheon given by the *Société Générale des Huiles de Petrole* (connected with the Anglo-Persian Oil Co). This proved to be more like a banquet than a lunch, and was a most splendid affair, but was all done in such a cheery and informal way that we thoroughly enjoyed ourselves.

There is no space to tell the names of all the charming people who were there, but when finally we left Douai, about 5 p.m., we were really sorry to leave so soon, and we shall long remember Douai the hospitable.

We had a good flight to Brussels, and found M. Maurice Lippens, the Minister of Transport, waiting to receive us at the Aerodrome. He gave us tea in the Club-house of the *Club des Aviateurs de Bruxelles,* which his daughter has just started. She is the only lady pilot in Belgium, but we did not see her, as she was away at the Wasserkuppe, learning to glide.

He told us that he had been at a Cabinet Meeting all the afternoon, and kept on getting messages that "three English aeroplanes had landed at Douai," "5 E.A.s had landed at Douai." "6 E.A.s had landed at Douai," etc., and he wondered if we had all had forced landings at Douai, until he got the message that "20 English aeroplanes have started for Brussels."

He said that this was too much for him, and Cabinet Meeting or no Cabinet Meeting he had to come and meet us.

Next day we woke to find impossible flying conditions, and had to stay on another night in Brussels. We had a very jolly time, however, and were most kindly entertained by the *Club des Aviateurs* to an excellent luncheon, which they organised on the spur of the moment.

They say it's an ill wind that blows no good, and the bad flying weather was good for us, because when we went to the aerodrome the captain of my ship reported weak compression in one cylinder, and it was found that we had a cracked cylinder-head.

This has not yet been accounted for, and it is such an unlikely flaw in a Gipsy engine that no spare head was carried. They telegraphed to Heston at once to send a new head out by Imperial Airways, and before 11 next day it was there, and by 5 p.m. the engine had been reassembled and we were all ready to start,—thanks to the efforts of the "ground staff" and Mr. Cantrill, who was always ready to lend a hand when anybody was in difficulties.

Most of the others had left that morning for Frankfurt, but Captain Baker had to stay behind owing to magneto trouble, and two other planes stopped there, too, and came on later with him.

When we left Brussels at 5 p.m. we thought we should be able to get straight through to Frankfurt and join the others before dark, but as we went south the weather got more cloudy, and at 7.30 we were still over the Taunus mountains, and realised that we could not make Frankfurt, or even Wiesbaden, before the light failed.

I didn't like it a bit! And when the captain said that he was going to land I thought of all the stories of wolves I had read about in my youth. However, all was well, and he found a big open patch of ground on the side of a hill

ON TOUR.—Salzburg and the Alps, as seen by the Easter Tourists.

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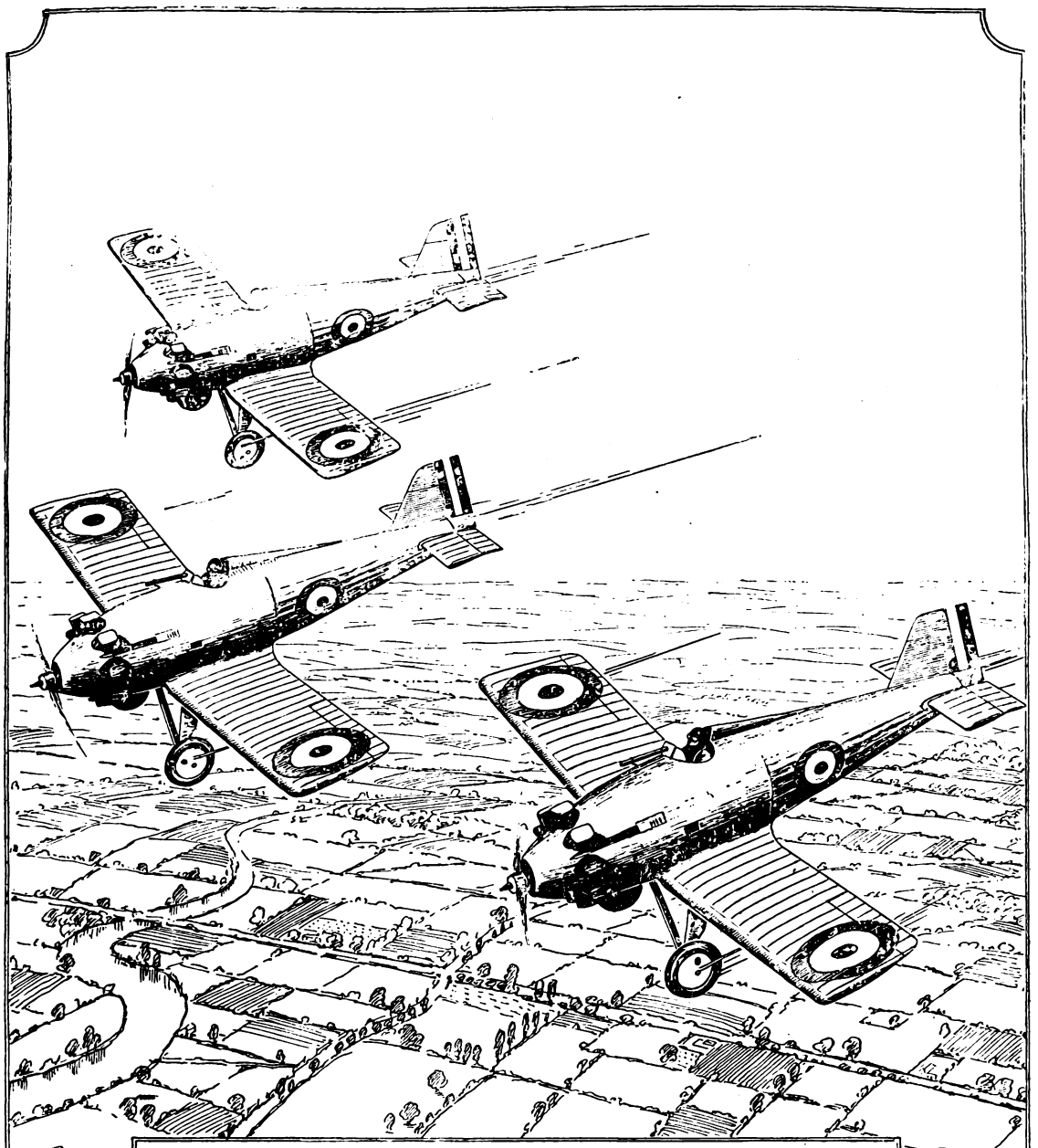

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liant sunshine and visibility of anything from 50 miles upwards.

We flew along the edge of the snow-capped Alps, which towered up above our right, and on the left the great plain stretched for mile after mile, a glorious green after the Winter rains.

There were very few real villages to be seen, but every mile or so one saw little clusters of red-roofed cottages looking unbelievably clean and peaceful. On the German plain the roofs of the cottages were all red, but when we got into Austria we noticed that they were almost all white, and the change was quite striking.

That night we slept in Munich, and many kind people came to welcome us at the aerodrome. In the evening we were the guests of the Munich Aero Club, who gave us dinner at a charming cabaret, where we all thoroughly enjoyed ourselves.

Next morning they came to see us off, and two of the members flew over to Salzburg to lunch with us.

Again, this flight was ideal and the weather perfect. The Aerodrome at Salzburg is just at the foot of the Alps, and the view from it is about as beautiful as anything could be. We only had a couple of hours there, but were all in love with the grand old town, and hope to return some day to visit the salt-mines, which we hear are most interesting.

After lunch we flew to Vienna over the foot-hills of the Alps. Bad landing-ground but magnificent scenery. Vienna from the air is a fine sight, with the Danube stretching across the plain as far as one can see. There is much argument about whether the Danube is blue. Up to the present it has been called every colour under the sun except pink, and the question is still under debate.

We had rather an anxious time when we got in last night, as Dr. Whitehead-Reid and Mr. Denman, in the Klemm, had not turned up before dark and had been seen last going over the Alps. But they telephoned to say that their engine packed up and they had to make a forced landing, but no damage done to the 'plane or crew, so all's well.

London, April 28, '30.

The last bit of news was that we had had a few anxious hours waiting for news of Dr. Whitehead-Reid and Mr. Denman, who were last seen going over the Austrian Alps in their Klemm on their way to Vienna.

Well, they joined the party again next day and then told us a really delightful story of their adventures. Their engine had suddenly packed up while they were over this somewhat unpleasant country and they made a good landing. To their astonishment they found they had evidently been gifted with a kind of homing instinct, for they had landed in the middle of an Englishman's property.

The owner was delighted to see them, gave them a splendid dinner and put them up for the night in his home, which was a beautiful old haunted castle, rebuilt in 1500! It really sounded too good a story to be true, but they assure us that it really was so.

They found that the magneto drive of the Siemens was all chewed up, and they were quite unable to fly the machine again, but the Klemm people were very decent about it and lent them another Klemm so that they could finish the tour with the rest of the party.

Some of us spent two days in Vienna, where we had a wonderful time, and then we followed the rest of the party on to Prague. The weather on this lap was extremely bumpy, but when we got to Prague all was forgotten in the warmth of the welcome awaiting us.

The Aero Club of Czechoslovakia were our hosts and entertained us to a really marvellous luncheon. The previous night they had looked after the other half of the party in the most wonderful way, even refusing to allow them to pay their hotel bills. And all were presented with the badges of the Club.

After lunch, or I should say about 5.30 p.m., we set off for Berlin, but some of us came down for the night at Dresden as the light was failing and we thought Tempelhof might be difficult to find in the smoke of Berlin so late in the evening.

Next morning early we flew on to Berlin, where we rejoined the rest of the party. We found at Tempelhof that the aerodrome authorities had hoisted the English flag in greeting,—which we all thought a very gracious and charming compliment.

Some of us were also surprised and amused to be greeted by a little hare which sat in the middle of that huge aerodrome and twiddled its ears at us. It sounds ridiculous, I know, but it really is a fact, and quite a number of us saw one or more hares,—though, as everybody knows, Tempelhof is almost in the centre of Berlin!

The whole party was entertained at luncheon by the Aero Club of Germany, of which Herr von Kehler is the President and Herr von Hoeppner the charming Secretary. Our hosts were all most kind and gave us a delightful party in their beautiful club rooms.

On Saturday the rest of us went on to Amsterdam, only stopping for lunch at Hannover, but some of the party went by way of Dessau, where they were shown over the Junkers Works. We flew from Berlin to Hannover in blazing sunshine, which we had had most of the time on the trip, but after Hannover we all got into beastly weather, thunderstorms and low clouds, and by the time we got to Amsterdam we all had some difficulty in finding the aerodrome, which was pretty well hidden in mist. But the aerodrome manager, Mynheer Dellaert, had the beacon lights switched on for us, and as soon as we landed a party of these kind and hospitable people took charge of us and gave us tea and a cheery little party in the Aerodrome Restaurant.

Then, more wonderful still, they presented each member of the party with a copy of the latest The Aeroplane, which they had had specially sent out from England for us. It was a funny sight to see the whole party sitting at tea on the Amsterdam aerodrome all silently reading The Aeroplane instead of talking to our hosts.

Then we found they had chartered a special boat for us, and they took us by Canal to the City. When we got on board the mist was swirling all over the country, and it was very cold, but our hosts seemed to think of everything, and as soon as the boat started we were each given a glass of Bols, and funny little cheese sandwiches, to keep out the cold. They say over there "A Bols a day keeps the rheumatism away."

One thing we have all noted for future reference is that one should plan to get to the Amsterdam aerodrome early in the day, except in the Summer months, as the mists creep up very quickly in the evenings at this time of year, and the surrounding ground is so intersected with canals and dykes that a forced landing would be most unpleasant.

That evening we were again most kindly entertained to dinner, and next morning when we went back to the aerodrome we were shown the new Giant Fokker and the *Southern Cross*, which were both in the Fokker hangar.

AT BERLIN.—Sq. Ldr. The Hon. R. A. Cochrane's Widgeon, and a Gipsy-Moth.

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CAPT. G. DE HAVILLAND

Captain Geoffrey de Havilland, O.B.E., A.F.C., F.R.Ae.S., who taught himself to fly in 1908, probably has more successful types of aircraft to his credit than any other designer. And the great aircraft firm he founded nine years ago now produces, in the Moth light aeroplane, a machine holding more world's records than any other light aeroplane made. It is significant that among the oils recommended by the makers for use in the Gipsy engine is Duckham's Adcol N.P.5 —in itself a striking tribute to this New Process oil. But it is a fact that Duckham's N.P.5 fulfils, and even surpasses, the requirements of the R.A.F.—the most exacting test in the world. Duckham's Adcol for better lubrication.

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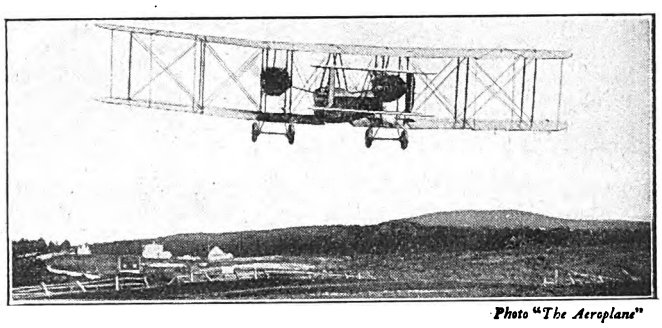

Photo "The Aeroplane"

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SOME OF THE TOURISTS.—A group at Tempelhof with some of their hosts.

The aerodrome itself is excellent, and the lighting arrangements for night landing must make it like day, as there are huge flood-lamps all round the border and a beacon tower, which is brilliantly lit up with white and red lamps.

The people at Amsterdam refused to let us pay for boats, or cars, or hangars, or landing fees, or refreshments. And the Customs officials never looked at our luggage.

On Sunday morning we flew to Ostende for lunch and it was a delightful flight as we passed over the tulip-fields round Haarlem and then right down the coast.

The tulips are in full flower now and the whole country looked like a great patchwork quilt of brilliant colours. The scent on the ground must be quite overpowering, because at almost 2,000 feet the whole air was heavy with it!

At Ostende Mrs. Cleaver rejoined the party. She had gone from Friedrichshafen to England in the *Graf Zeppelin*, and had been met at Cardington by Mr. Cameron with her Moth, in which she flew to London on Saturday night. On Sunday morning she flew to Ostende and came back with the rest of us to Heston.

After lunch came the return hop across "The Ditch" and the weather was so clear that over the French coast at 3,000 feet we could just see the outline of England. A few minutes only and we were over Kent, and very pleased to see our large English fields under us once more, instead of the little strips of Northern France and Belgium.

At Heston, where we all arrived within a quarter of an hour, we all found friends waiting to welcome us home, and we personally were very lucky, for to our great pleasure we found four of the London Aeroplane Club birds waiting for us, and we were able to finish our tour in a very cheery spirit as they all "formated" us back to roost at Stag Lane.

So ends the Heston Spring Tour, the best holiday anybody ever had. And we all feel that we owe a great tribute to the reliability of the Light Aeroplane.

The Wanderers' Return.

"Except for the kindness of the people en route the tour was singularly lacking in incident." This remark was made by one of the returning Heston Club air tourists and adds force to the old adage that no news is good news, because there was difficulty in learning anything in their absence.

Of those who made a short tour with the party and returned during the week, J. D. Turner landed at Heston on Easter Monday. Messrs. P. A. and W. D. Wills came back in G-EBOI (Cirrus-Moth) on Tuesday, and G. H. Ambler arrived in his Gipsy-Moth. A couple more Moths returned on Wednesday, piloted by W. D. McPherson, who left Miss McPherson to follow next day in the Desoutter with Mr. and Mrs. F. A. I. Muntz, and Mr. Hofer whose passenger was Miss Trevelyan. The Desoutter duly turned up on Thursday, as did Mr. J. R. Bryans in a Gipsy-Moth, and Lord Malcolm Douglas-Hamilton in Moth G-AAEB.

Mr. H. Peake and Flt. Lt. R. L. R. Atcherley, flying the Bluebird, G-AAUU, made their trip into a short cruise by flying the complete circuit two days faster than the rest. They got back on Friday.

Mr. W. R. D. Perkins got in on Sunday with Mr. Haward, who flew with him from Ostende after accompanying the tour from Cologne onwards with Mr. A. H. Downes-Shaw in his Moth. Mr. Downes-Shaw chose to remain at Brussels for a while longer on the way home. Lord Clydesdale and Mr. Noble, in Moth G-AAKE, also came in on Sunday.

Sq. Ldr. the Hon. R. A. Cochrane, who had joined the party in the Widgeon, G-EBRO, felt a little off-colour, and elected to stay awhile in Berlin on the return trip, so Mr. J. L. Shand stopped there as well.

Sunday's arrivals include all the rest of the party: J. Cantrill and Mr. Williams in Gipsy Moth, G-AALX; Mr. Nigel Norman and Miss Norman in Gipsy-Moth, G-AAHI; Capt. V. H. Baker and Mrs. Richard Baring in Gipsy-Moth G-EBYK; Mr. and Mrs. J. W. P. Chalmers in Gipsy-Moth G-AACO; J. Cameron and Mrs. Cleaver in Gipsy-Moth G-AAVY; Dr. Whitehead Reid and Mr. R. P. G. Denman in a Siemens-Klemm and Mr. H. Gordon Selfridge, Junr., in Gipsy-Moth G-AASU.

AN AIR RALLY IN DORSET.

On May 10 the Parnham Country Club, Beaminster, Dorset, is organising an Air Rally to which certain favoured aviators have been invited. Prizes will be given for the first and second to arrive after a fixed hour.

Parnham was the home of the late Capt. W. B. Rhodes-Moorhouse, V.C., R.F.C. It is an historic Tudor mansion.

The Air Rally and the subsequent events are being organised by Miss Sicely O'Brien, to whom application should be made at 282, Earl's Court Road, London, S.W.5.

THE SHERBURN MEETING.

National Flying Services Ltd. are making a special effort to attract private owners of aircraft in their arrangements for the Yorkshire Air Pageant on May 10 at Sherburn-in-Elmet. Visiting Pilots will not be charged housing fees, and landing fees will be waived.

A Yorkshire Air Race of 30 miles, a balloon-bursting competition and an "All Forms of Transport" race provide variety for the spectators and prize money for the winners.

Other attractions will be the invariably fine aerobatics of Flt. Lt. H. M. Schofield, with both Moth and Desoutter, individual aerobatics, demonstrations of the Comper Swift and the Autogiro, and a parachute descent by Mr. John Tranum.

THE FOURTH ASHWELL-COOKE COMPETITION.

The next Competition for the Ashwell-Cooke Cup will be held at Lympne at 15.30 hours on Sunday, May 4, when the Cinque Ports Club hope to have a much bigger attendance and many more competitors than at previous meetings.

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THREE MORE

CATERPILLARS!

On April 17, a Japanese officer escaped from his burning R.A.F. 'plane over Hornchurch. On April 11, Two Royal Air Force machines collided with terrific force at 3,000 feet over Chichester. All these pilots jumped from their 'planes and saved their lives with

IRVIN AIR CHUTES

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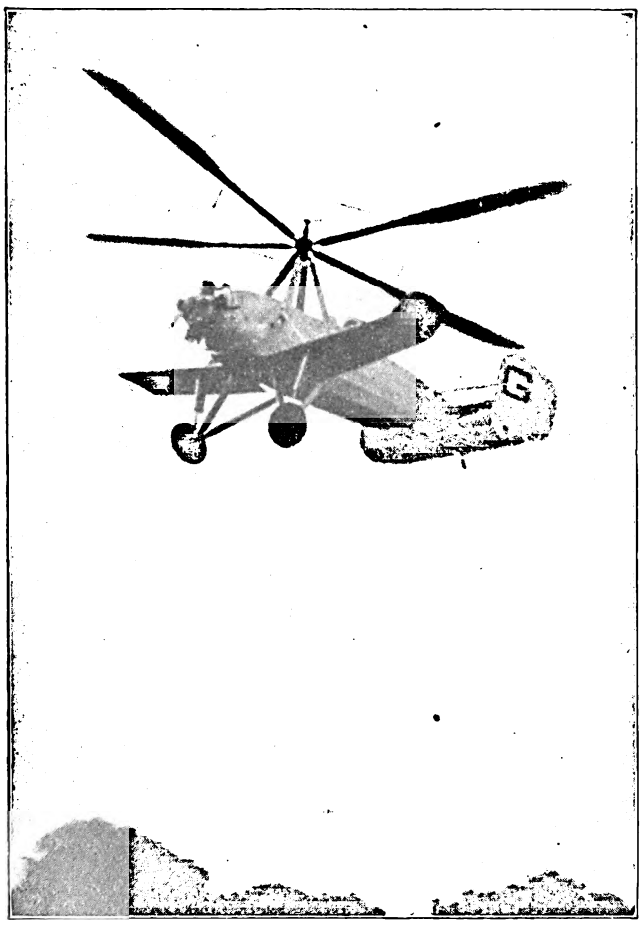

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READING AIR PAGEANT

Premier event won on

The New "BP"

Miss W. E. Spooner, flying a D.H. Gipsy Moth, at the Reading Air Pageant won the Berks, Bucks and Oxon Challenge Cup.

Miss Spooner used the New "BP," the same as can be obtained from any pump with the shield-shaped globe.

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COMMERCIAL AERONAUTICS.

FOUR YEARS' TRADING.

If one examines for the years 1926-27-28-29 the figures which show the value of exports of Aeroplanes, Engines and Parts which have been manufactured in Great Britain and Northern Ireland, quite a healthy state of affairs is revealed. The most convenient way to examine these figures is in tabular form, so they have been divided into two groups: Exports to Foreign Countries; and Exports to British Dominions and Colonies Overseas.

FOREIGN COUNTRIES

	1926		1927		1928		1929	
	No.	Value	No.	Value	No.	Value	No.	Value
Aeroplanes	34	£76,804	27	£31,515	75	£86,821	211	£293 883
Engines ...	117	£125,993	73	£54,042	90	£56,307	954	£329,879
Parts		£51,998		£57,951		£108 826		£387,633

BRITISH OVERSEAS DOMINIONS

	1926		1927		1928		1929	
	No.	Value	No.	Value	No.	Value	No.	Value
Aeroplanes	9	£6,510	18	£20,772	45	£44,371	314	£509,655
Engines ...	3	£2,060	17	£13,788	12	£4,175	194	£173,659
Parts		£22,390		£26,093		£34,746		£461,958

The first thing that strikes one is the enormous increase in 1929 over the preceding years. The figures go up by leaps and bounds. In every instance they are over double the best previous figures. In some they are over ten times better.

The next thing that becomes apparent is that the British Colonies and Possessions have for the first time become better customers than foreign nations. This is true of the total exports, of aeroplanes and of parts, but not of engines.

British aero engines have a very large sale abroad. In 1929 Russia bought over £36,000 worth, Sweden over £12,000, Denmark over £22,000, Germany over £18,000, Holland and her possessions over £60,000, Egypt over £22,000, Japan over £23,000, and the United States over £70,000.

The last-mentioned country brought with this money just over 300 engines, so their purchases would mostly seem to be engines for light aircraft.

There are only three British territories whose purchases are over £10,000. These are British India with over £46,000, Australia with over £63,000, and Canada over £39,000.

There were seven big foreign purchasers of complete aeroplanes. These were Latvia which spent over £15,000, Spain over £20,000, China (exclusive of leased territories such as Hong Kong) over £16,000, the United States over £48,000, Chile over £41,000, Bolivia over £48,000, and the Argentine Republic over £46,000.

The biggest British purchasers of complete aircraft were the Union of South Africa with over £20,000, British India over £140,000, Australia over £173,000, New Zealand over £31,000, and Canada over £121,000.

MORE AERODROMES FOR AUSTRALIA.

The latest issue of *The Aviation Bulletin*, published by the Vacuum Oil Company Pty., Ltd., in Melbourne, Australia, takes the form of a special Landing Ground Issue, and it is a most stimulating example of just that kind of enlightened selfishness which is going to benefit aviation—not to mention the far-sighted company which exhibits it.

Landing facilities have far more bearing on the safety of flying than any improvements in aircraft or engines that are likely to be made within the next year or two. This is a point that is often overlooked, and in view of the very elementary equipment needed to make a safe alighting spot in the midst of a desolation of death-traps the time has come for some interested party to get selfish enough to move in the matter. This is exactly what the Vacuum Oil Co. is doing with energy and effect.

The leading article in the special issue of the *Bulletin* points out the urgent need for more fields, in order to give the benefits of air travel to those places which have most to gain therefrom: and they are the districts grimly described as "out-back."

The country town without a landing field will shortly be in the position of the backward village without a garage, at which the motorist carefully avoids stopping, and leaves it his dust rather than his money. In company with the Louis Coen Wireless Pty., Ltd., the Vacuum Oil Co. recently sponsored a campaign for a landing ground near every town, and visited 270 of them. To every community willing to provide a field they presented a wind-indicator, and the effect was even more striking than might be expected.

The article lays emphasis on the inexpensiveness of beginning an airport, provided that it is done early and a few reasonable precautions are observed. The requirements of a landing field are not drastic, and if the site is chosen while land is cheap it can be developed gradually from the wind-sock up, so to speak.

The Ballarat aerodrome is an excellent example, because it has been made into an exceedingly good landing ground at an initial cost for clearing, grading, etc., of about £150.

Full information on ground-markings, with diagrams, is included in the article which cordially invites the city fathers of any ambitious community to apply to Vacuum Oil for further advice.

The second half of the special issue contains a list of nearly 300 landing grounds in various parts of Australia, indicating for each one whether it is licensed, whether under municipal or private control, emergency or regular, its approximate location and its characteristics. A more useful document for casuals of the air, or any other kind of aviator, is hard to imagine.

The modern sport-pilot is less familiar with forced landings, thanks to the reliability of modern engines, than his pioneer forbears were, and he flies machines which land faster; therefore to him the sight of a wind indicator is as water in the wilderness. It indicates interest in his welfare and brings peace to his soul. His kind will wish the enterprising Vacuum Oil Co. not only good luck in their philanthropy but also abounding success of the more sordid and oleaginous variety.—F. D B.

OPINIONS WANTED.

The following letter is commended to all those who wish to advance the progress of Aviation. Opinions will be welcomed, and those which seem to be of value will be published:—

Sir,—In your issue of Mar. 26 there is an editorial comment, over the initials T. J., apropos the disaster at Ocean Side. It raises a subject on which one finds it difficult to think dispassionately—that of fire following air crashes. The following is an attempt to treat analytically the question of where to put the petrol carried in an aeroplane.

One may, I think, safely start from the assumption that if on crash the petrol tank bursts, and the petrol catches fire, the whole machine will be enveloped in flames so rapidly that all hope of saving the lives of passengers or crew is extremely remote.

This would appear to be the case no matter where the petrol is carried. If this is so, safety efforts should be concentrated entirely on the avoidance of fire following crash rather than on minimising the consequences of fire once it has occurred.

Now, the only source of ignition on board an aeroplane is, to all intents and purposes, the engines themselves, and therefore, to minimise the risk of outbreak of fire it seems clear that petrol should be placed as far away from the engines as possible, and with as little chance as possible of being splashed over the engines in a crash.

If, therefore, in any given machine the designer is faced with the alternative of placing the petrol tanks either near the engines or near the passengers, I think the latter alternative must be preferable.

This seems to be a typical case in which the dictates of instinct and reason are in complete conflict.

It would be interesting and instructive to have the comments of your readers on this point of view. My own principal reaction to this unpleasant subject is that aeroplanes should be designed, not with a view to scientific crashing, but with a view to scientific avoidance thereof.

(Signed) M. L. BRAMSON.

THE LATEST AIR YACHT.

The Supermarine three-engined monoplane flying-boat recently built for the Hon. A. E. Guinness by the Supermarine Aviation Works, Ltd. is the most luxurious air vehicle yet turned out in England. This flying yacht, which was described in THE AEROPLANE of Feb. 26, is beautifully finished inside with all the amenities of a sea-going vessel, and has sleeping berths, wardrobes, a bathroom, and a cook's galley, as well as a lounge. The latest photograph of it appears on the front cover of THE AEROPLANE this week.

An important item in the equipment is a comprehensive wireless installation. Mr. Guinness has already owned a flying-boat of large size—a Supermarine Solent which he bought in 1927. He equipped that craft with a 150-watt Marconi A.D.6 aircraft transmitter and receiver. In the new yacht he has installed a Marconi half-kilowatt A.D 8

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type, enough for reliable two-way communication with aerodromes, coast stations and vessels at sea up to 400 miles.

A direction finder of the Marconi A.D.16 type will make navigation possible in bad visibility and a Marconiphone of Type 35 will provide entertainment from British and Continental broadcast programmes.

Irrespective of the last entertainment item, which is purely luxurious, the wireless equipment is a vitally important thing in this day and age. All-weather travel, which a yacht of such pretensions, even though of the flying kind, must be able to tackle in the day's work, cannot be attempted with any safety without good wireless.

THE SEAL OF OFFICIAL APPROVAL.

The D.H. Gipsy Two engine has been officially approved by the Air Ministry as airworthy in the Normal Category for use in civil aircraft under Air Navigation Regulations and Directions. The Gipsy Two passed the type tests at a rating of 105 h.p. at 2,000 r.p.m. at sea-level in February of this year.

THE DEATH OF MR. WOOLSON.

On Apr. 23 an aeroplane flew into a steep hill near Attica, N.Y., during a blinding snowstorm. Among the three persons killed was Mr. L. M. Woolson, the aeronautical and research engineer of the Packard Motor Company. He was the designer of the Packard Diesel Engine which is now being put on the market and is the first Diesel aero-engine to be manufactured for sale.

THE LONDON TERMINAL AERODROME.

ANALYSIS OF FIGURES FOR WEEK ENDING APRIL 19.

Trips per Day.—Sunday, 13; Monday, 25; Tuesday, 27; Wednesday, 33; Thursday, 34; Friday, 32; Saturday, 30.

Imperial Airways Ltd.:
London—Egypt—India: London—Le Touquet—Paris—Basle—Zurich: London—Ostend—Brussels—Cologne and return: Machines 63, passengers 455, freight 19¼ tons. India Route: Inward, passengers 0, mail 595 lbs.; outward, passengers 2, mail 621 lbs.

Air Union:
Paris—London: Machines 49, passengers 190, freight 11 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 28, passengers 101, freight 10 tons.

Sabena:
Brussels—London: Machines 23, passengers 68, freight 3 tons.

Deutsche Luft Hansa A.G.:
Amsterdam—London: Machines 26, passengers 25, freight 4¼ tons.

Miscellaneous:
British machines 5, passengers 3.
Foreign machines 0, passengers 0.

Total number of trips by British machines, 68, carrying 458 passengers. Foreign machines, 126, carrying 384 passengers.

COMPARATIVE FIGURES.

Week ending April 19:
Machines, 194; Passengers, 842; Crews, 506; Total personnel, 1,348.
Corresponding week, 1929:
Machines, 159; Passengers, 919; Crews, 315; Total personnel, 1,234.
Corresponding week, 1928:

ANALYSIS OF FIGURES FOR WEEK ENDING APRIL 26.

Trips per Day.—Sunday, 13; Monday, 24; Tuesday, 34; Wednesday, 30; Thursday, 28; Friday, 33; Saturday, 33.

Imperial Airways Ltd.:
London—Egypt—India: London—Le Touquet—Paris—Basle—Zurich: London—Ostend—Brussels—Cologne and return: Machines 61, passengers 452, freight 17 tons. India Route: Inward, passengers 4, mail 620 lbs.; outward, passengers 2, mail 747 lbs.

Air Union:
Paris—London: Machines 53, passengers 220, freight 11¼ tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 29, passengers 110, freight 8¼ tons.

Sabena:
Brussels—London: Machines 18, passengers 44, freight 3 tons.

Deutsche Luft Hansa A.G.:
Amsterdam—London: Machines 25, passengers 25, freight 3¼ tons.

Miscellaneous:
British machines 9, passengers 9.
Foreign machines 0, passengers 0.

Total number of trips by British machines, 70, carrying 461 passengers. Foreign machines, 125, carrying 399 passengers.

COMPARATIVE FIGURES.

Week ending April 26:
Machines, 195; Passengers, 860; Crews, 494; Total personnel, 1,354.
Corresponding week, 1929:
Machines, 174; Passengers, 975; Crews, 384; Total personnel, 1,359.
Corresponding week, 1928:

CROYDON NOTES.

If some hard-working pilot, striving to turn an honest penny, had flown a passenger for hire and reward over the Cup Final at a height sufficiently low to distinguish the patterns on the Huddersfield spectators' cloth caps (600 to 800 feet for some of the bolder new season cappings) he would have been guilty of serious civil disobedience. On landing after the crime he would have been seized by armed myrmidons and in a suit of gyves, shackles and fetters would have been transported to Gwydyr House with all speed in a plain van.

Probably the appropriate penalty for this offence is forty shillings or life imprisonment in cellars hundreds of feet below the pavements of Whitehall, in which dreadful places they keep the mouldering records of advantageous Aviation Enterprises nipped in the bud at birth. As no pilot was ever known to have 40s. in the lump, his fate would have been sealed.

Apparently you have to be a German Airship or a coffee-coloured gent of mummified appearance in gold-rimmed glasses, a bath towel and slippers, before you can get away with Civil Disobedience within the British Empire.

Ordinary blokes trying such on Boat Race night always seem to end up abruptly in Vine Street, and the only example of a hunger-striker on such an occasion was one who could not look his breakfast-egg in the face anyway, so he was appropriately fined by the beak and thrown out on his ear.

Spry sometimes wonders what would happen if he so far tampered with the Nation's supply of thirst-provoking condiment as to heave a lump of rock salt at a village Constable or provocatively fry a slice of Cerebos over a spirit lamp outside Gwydyr House? Ah well! What's sauce from a Goose is O.K. from a Ghandir, as the old proverb says.

The mysterious birth of Aerodrome slang, which includes such monstrous terms as "Sky Harbour" for an Aerodrome in America, is illustrated by the christening of a combined roller and tail skid invented by the Fokker Works and fitted to several K.L.M. machines. This device, by the way, looks like being eminently successful, and it has certain virtues which neither tail wheel nor tail skid possess, especially in very soft ground.

Anyhow, as roll means roller in Dutch and ski means ski in some Norse tongue, the device was called the Rollski by some earnest etymologist and was immediately re-christened "the Polish leg" by some ribald pilot, and there you are.

Mr. Mockford, one of our very oldest inhabitants, who has been nigh eleven years in Air Ministry employ at Hounslow and Croydon, is leaving his post as Wireless Supervisor to go to the Marconi Company in a fortnight's time. Mr. Mockford has been very largely responsible for making the standard of wireless communication higher than that of most, if not all, European aerodromes, and he will be very greatly missed by numerous friends at Croydon.

One of the Imperial Pilots, not exactly possessed of a Devil, but at least haunted by a poltergeist or troll, had his car break its back springs near Martlesham (ominous spot) at the crack of dawn recently. Malign influence caused the back wheels to lock like a Chubb safe, and he had to walk eight miles muttering, "A Horse, a Horse, my Kingdom for a Moth." He also said, "Ick! Ick!" many times. Eventually, being due to take the 10.15 machine, he reached civilisation by about 9.45 in time to 'phone and say he could not compete

The same gentleman had an incredible creature in a crate as passenger a day or two later, with enormous eyes and long furry arms with pink palms to the hands. When incautiously let loose it hitched its lengthy tail to a roof-beam, climbed up same, and went to sleep. It is thought to be an Assyrian Afreet or a Gadarene Ghoul. The pilot is to be exorcised and bathed in Condy's Fluid, when it is hoped he will be made whole and in his right mind.

A Control Tower Officer having passed gloriously in every other subject in the recent Navigation Examination, failed dismally in "Legislation," the thing that he knew most of all about.

According to an Evening Paper with the usual outlook on Aviation matters, certain Indian agitators were burning piles of gents' suitings made of foreign cloth, when an aeroplane circled overhead, causing some panic, *but nothing serious happened*. Presumably the journalist who wrote those lines expected it to fly to pieces or go off pop. Fancy an aeroplane flying, and nothing serious happening Dear, dear, what a surprise!

In The Aeroplane of April 16, under the heading "A Happy Ending," a statement appeared to the effect that K.N.I.L.M (Royal Netherlands-Indies Air Lines) have received permission from the Indian Government to use various aerodromes from October 1, and that the K.N.I.L.M. would therefore begin fortnightly flights to the Dutch East Indies.

The K.N.I.L.M. is a sister company of the well-known European K.L.M. (Royal Dutch Air Lines), but the activities of the K.N.I.L.M. are confined to operating air lines in the East, which incidentally are highly successful. It is the well-known European K.L.M. (Royal Dutch Air Lines) which has organised and will operate the Air Mail route between Holland and the Netherlands Indies.

K.L.M. pilots, all of them well known on the European air routes, will fly K.L.M. aircraft to and fro on this mail route, and it cannot be too clearly stated that except for the help from the sister company in the Netherlands Indies on arrival, etc., the whole organisation and operation of this highly important air mail link will be in the hands of the K.L.M. (Royal Dutch Air Lines).—Spry.

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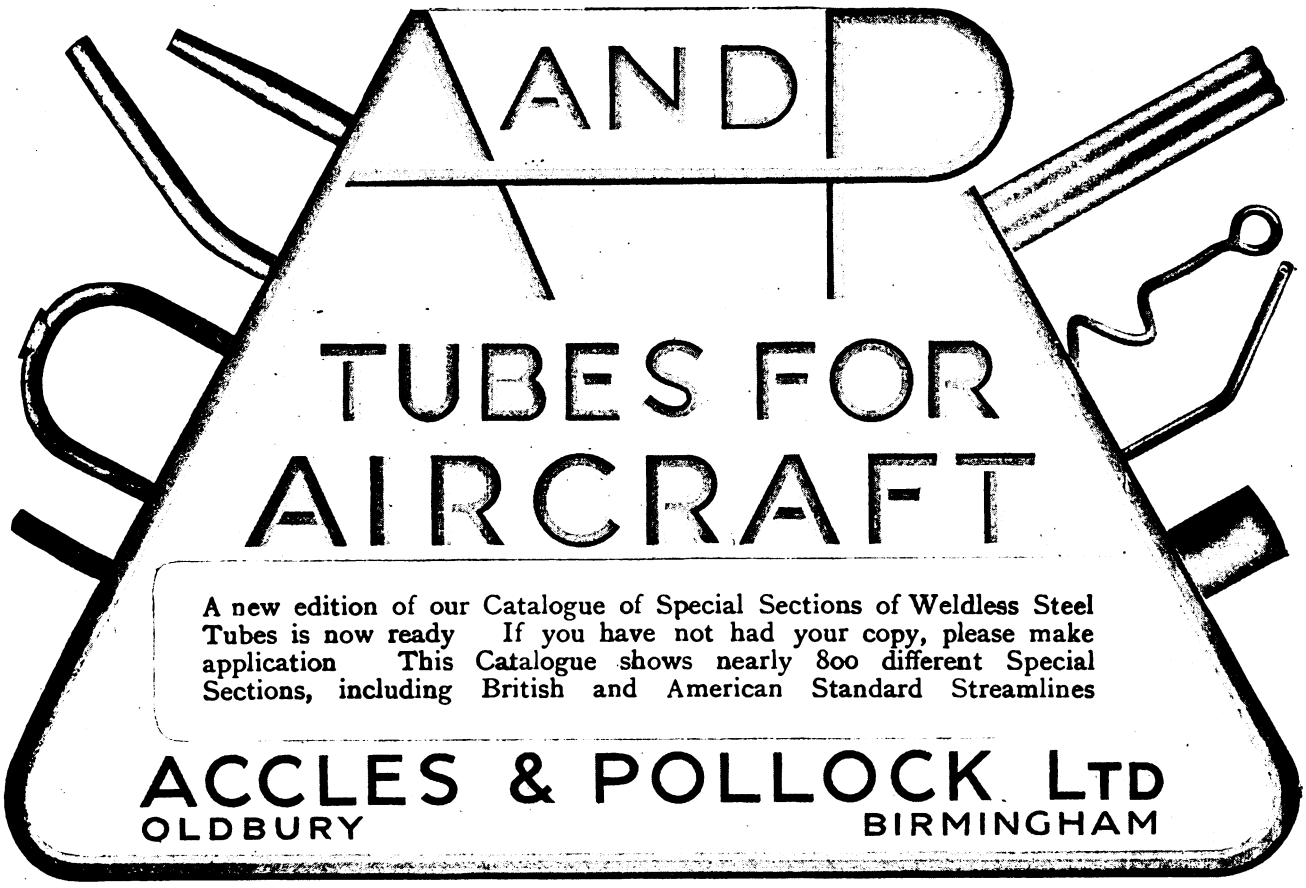

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Southern Rhodesia.
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"MUD AND SAND."

A sensational new film is now showing in England, free of charge, to any one who can make out a good case for being really interested, through the courtesy and enterprise of the Goodyear Tyre and Rubber Co. (Great Britain), Ltd. Its theme might, for publicity purposes, be described as an exposure of soft spots in the aircraft industry, but actually it demonstrates the Goodyear Air Wheel, a spokeless, large-volume, low-pressure pneumatic wheel.

According to the film, pilots in its native country call it the "feather-bed." We beg leave to doubt that, as we have met several over there who refer to it as the "doughnut," a much more apt comparison, because that comestible is characterised on the far side of the Atlantic by a hole through its middle, and otherwise by the same compressibility and rubbery resilience which it possesses in any other country.

In spite of staging, which is inevitable in a film of which the purpose is to show off a product to advantage, the picture is still a striking demonstration of an admirable gear for soft ground. What it will do on hard surfaces is left to the imagination, but it is difficult to see what real drawbacks it could show there as compared with the mud and sand of the picture.

Aircraft are shown "ground looping" in safety with Air Wheels, but with violence enough to wipe off high-pressure tyres and buckle wheels. Goodyear wheel-brakes quite obviously give powerful control on the ground.

The spectator sees a Whirlwind-Pitcairn hopelessly bogged to the axles in spite of full throttle and a band of wind-blown pushers. A Fokker Super-Universal, equipped with Air Wheels, institutes the necessary insulting comparison by taking off, landing and ultimately taxi-ing in a circle round the bogged craft without difficulty or outside assistance. Finally, after the high-pressure tyres and their wearer has been hauled ignominiously away, the heavy transport is seen rolling over the same spot, leaving broad shallow tracks with its dumpling-ish wheels.

The central portion of the wheel consists of a hub only, so the demonstration, very clearly photographed by a camera strapped under the bottom wing, of a take-off and landing with a slit tyre, is one of the most striking parts of the film. Such a take-off would scarcely be necessary, but landings after a puncture may be called for any time, and the ease with which both were effected with no more than deflated rubber flapping round the hub was quite a revelation.

The makers do not claim that shock-absorbing legs can be dispensed with when the Air Wheel is used, but none of the demonstration machines on the film used any other means of giving resilience to their undercarriages. The weight of the Air Wheel is greater than that of the normal type but the drag is said to be less. The picture did not show an aeroplane actually taxi-ing through deep sand, probably on account of the poor visibility that would result, but towing tests through sand showed the same ability of the Air Wheel to ride squidgily over surfaces that would engulf ordinary tyres.—F. D. B.

THE PHILLIPS AND POWIS ANNIVERSARY.

Easter Monday was the first anniversary of the Phillips and Powis School of Flying. Starting with one Mark 1 Moth, the school has developed to such an extent that eight Mark II and Gipsy Moths are now in commission. All of them are painted in the school colours of cream and yellow.

Instruction has been given to 300 pupils and 16 "A" licences obtained. And at least 6 others have completed solo flights and are ready to pass their tests.

Hours flown for the year total 1,200, a number the school hope to exceed greatly during the coming year, in view of the instructional flying rates being reduced to £2 an hour.

Mr. W. S. Giddy is the Chief Instructor and Mr. J. H. A. Wells assistant. In addition to instruction, the school is open to air work of all kinds—pleasure flying and taxi work. The Company also runs an efficient workshop capable of repairing all types of aircraft, and a Sales Department which has been successful in selling several new and second-hand light aeroplanes.

WHAT WORK MEANS.

People who think that making aerodromes merely consists in pulling up hedges and chopping down trees will be enlightened by a few facts taken from a letter from Mr. C. P. Hunter, of James Hunter Ltd., of Chester, who are the constructional engineers for a number of the new aerodromes which are now being made in this country.

Referring to the new Fairey aerodrome, which has an area of 150 acres, Mr. Hunter says that when his firm have finished their work he and his men will have travelled not less than 20,000 miles over its surface. To sow it and roll it alone they have to travel all of 750 miles, and there are over 60 miles of drains in the area, simply as an advance scheme. But the result is an aerodrome over which a car can travel at 50 miles an hour.

AS USUAL.

Mr. C. D. Barnard cabled as follows to K.L.Gs.:—

K.L.G. Plugs, Putney Vale, London: Your plugs wonderful not a misfire throughout flight. Congratulations.—Barnard.

Titanine-Emaillite Ltd., the makers of the World-famous "Titanine" dope, have received the following cable:—

Your dope quite unaffected by tropical heat and heavy rains experienced on flight.—Barnard.

These cables were sent from Cape Town immediately after the arrival of the Fokker F.VII, *The Spider*, in which Her Grace the Duchess of Bedford, Mr. C. D. Barnard and Mr. R. F. Little made the record flight from London to Cape Town in 9½ days.

HELPING PROGRESS.

The Air Ministry have placed with the British Thomson-Houston Co. Ltd., a contract for the supply of MAZDA Lamps for 3 months—or such longer period as the Ministry may desire.

We all hope that the result may be the enlightening of sundry obscurities which hamper progress in the Air House.

Also we hope that the B.T.H. people will soon come into the public view with a comprehensive system of lighting such as is needed on aerodromes and air routes before air transport can be considered commercially successful.

There are many excellent systems in use in other countries, notably in Germany and in the United States, and the time has quite come for some really intelligent British firm to lighten our aeronautical darkness. No firm is better qualified for such work than is the B.T.H.

SILVER WINGS.

A very pleasant 'busman's holiday can be spent by aviation people in a visit to a performance of *Silver Wings*, the musical comedy at the Dominion Theatre. The aviation part of it, which concerns an attempt to fly the Atlantic ending in a forced landing through a roof in Mexico, shows none of the usual theatrical ignorance when dealing with flying.

There is a story that when a certain well-known aircraft manufacturing firm were asked to supply an aeroplane for the production, they replied coldly that their machines did not crash. According to the programme the aeroplanes are supplied by the Brooklands School of Flying and, naturally, are very good ones indeed. Any machine might be excused for crashing in such a thunderstorm with the added attraction of the fetching Mexican chorus among whom it descends. The whole show is amusing and the music very good.

A NEW COMPANY.

Spartan Aircraft Ltd. was registered as a "private" company on April 26, with a nominal capital of £110,000 in £1 shares. The objects are to take over the whole issued share capital of the Simmonds Interchangeable Wing Co. Ltd., and the whole of the undertaking and assets (including the trade mark "Spartan") of Simmonds Aircraft Ltd., to adopt an agreement with O. E. Simmonds and C. F. Simmonds, the holders of all the issued share capital of the Simmonds Interchangeable Wing Company Ltd., and to carry on the business of manufacturers of and dealers in aircraft wings, aeroplanes, seaplanes, flying-boats, hydroplanes, airships, balloons, flying machines and aircraft of all descriptions, ships, vessels, engines, automobiles, cycles and vehicles, etc. The first directors (to number not less than 3 nor more than 7) are: A. S. Chambers, Woden House, Goring-on-Thames, chartered civil engineer. J. de C. Ballardie, 2, The Terrace, Richmond, C.A. O. E. Simmonds, "Holmfels," Woolston, Hants, aeronautical engineer. H. H. Balfour, address not stated. W. D. L. Roberts, address not stated. L. A. Strange, address not stated.

Subject to certain "vacation" clauses in the articles, O. E. Simmonds shall be a director during the whole or such part of a period of five years, as he shall be under contract to serve the company in any other capacity, and there is a similar provision with regard to W. D. L. Roberts and L. A. Strange for a period of three years. Solicitor: H. Davey, 47, Parliament Street, E.C.1.

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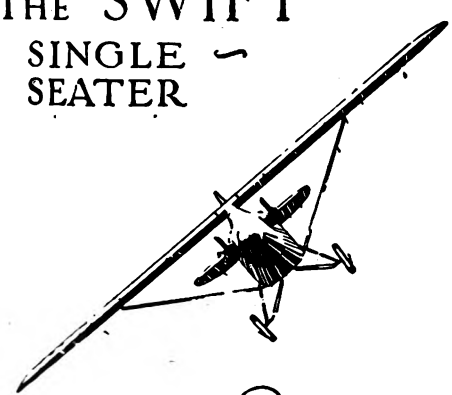

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PERSONAL NOTICES.

DEATHS.

BARRON.—At Heliopolis, Egypt, on April 23, as the result of a flying accident, Francis Slade Barron, Plt. Off., R.A.F.

Mr. Barron entered the R.A.F. with a short service commission in November, 1928. After a course of flying training at No. 4 Flying Training School, Abu Sueir, he was posted in November, 1929, to No. 47 (Bomber) Squadron, Khartum.

BONHAM-CARTER.—On April 24, at Halton Camp, Bucks, the result of an accident, Peter Richard, elder son of Air Commodore and Mrs. I. M. Bonham-Carter, aged 17.

CHARLTON.—On April 25, at Cranwell, as the result of a flying accident, AC.1. Leslie Edward Charlton, R.A.F.

COAN.—On April 14, at Canonbury, London, Robert William Coan, aged 66 years.

[Mr. Coan was one of the pioneers of aluminium castings in this country. From the earliest days of motoring "Coan Casts Clean Crank-Cases" has been a catch-phrase. Personally he was an excellent example of the self-made business man,—cheery, amiable, dead straight, and as keen as they are made. He is a loss to the community.—C. G. G.]

DAVIS.—At Heliopolis, Egypt, on April 23, as the result of a flying accident, AC. Cyril Fred Davis, R.A.F.

FEARN.—On April 25, at Cranwell, as the result of a flying accident, Sjt. William Henry Fearn, R.A.F.

SPEAKMAN.—On April 26, at Aberdeen, Eric Peter Speakman, The Walmsleys, Leigh, Lancs, and the R.A.F. Club, London, aged 32 years.

MARRIAGES.

MACKAY—ELLERSHAW.—On April 25, at Wymering Church, Cosham, Malcolm Bruce Mackay, R.A.F., younger son of the late the Rev. E. B. Mackay, to Katharine Ellershaw, third daughter of the late Brigadier-General W. Ellershaw, R.A.

VAN OPPEN—BURGESS.—On April 19, at South Kensington, Ernest C. van Oppen, R.A.F., to Maud Burgess, of Cottingham, Market Harborough.

WEST—McEACHRAN.—On April 22, at Birmingham, Flt. Lt. R. W. Gordon West, R.A.F. (retired), to Mary Charlotte McEachran.

WISEMAN-CLARKE—PEMBERTON.—On April 26, at Knightsbridge, Flt. Lt. Freke William Wiseman-Clarke, R.A.F., son of Mr. and Mrs. Wiseman-Clarke, of 61, Cadogan Square, S.W., to Cynthia Mary, daughter of Major and Mrs. Pemberton, of 6, Bedford Gardens House, Campden Hill, W.

BIRTHS.

FAIRWEATHER.—On April 23, at Eastchurch Cottage, Foxon Lane, Upper Caterham, to the wife of Flt. Lt. J. MacG. Fairweather, D.F.C., R.A.F.—a son.

GROOM.—On April 11, at Quetta, Baluchistan, India, to Maisie, wife of Flt. Lt. V. E. Groom, D.F.C., R.A.F.—a son.

JONES.—On April 20, at Leasingham, Lincs, to Nowelle (*née* Billings), wife of Flt. Lt. Philip Jones—a son.

LOWIS.—On April 21, at 37A, Porchester Terrace, W.2, to Lallie Lee, wife of Lt.-Cdr. G. L. Lowis, A.F.C., R.N. (retired)—a daughter.

TEGNER.—On April 27, at 17, St. Mary Abbott's Terrace, to Helen, wife of Henry Stuart Tegner—a daughter.

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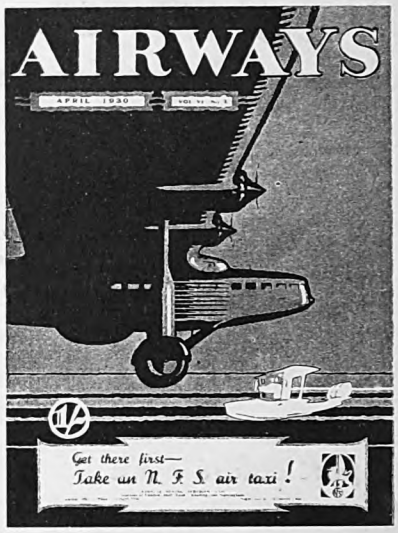

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Immediate cash for modern aircraft, crashes or engines. Arnold Jones, 58, Warren Street, W.1. Museum 7915.
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Wanted a 3-seater Joy-riding machine with C. of A. Stationary engine preferred. Reply Box No. 5816, THE AEROPLANE, Cannon House, Pilgrim Street, E.C.4.
Wanted, Small flying-boat. Twin engines preferred. Apply T. C. Pattinson, "Raaeswyke," Windermere.

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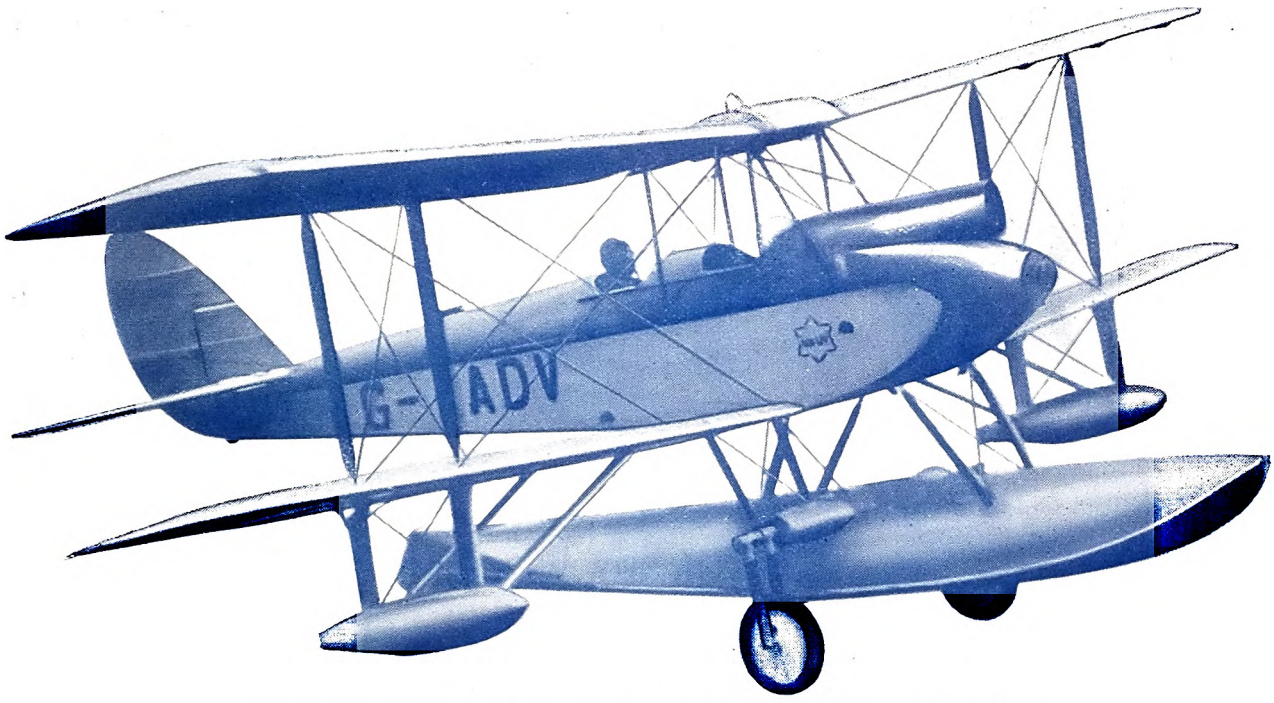

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The following telegram, dated April 21st, was received from Capt. Barnard from Capetown:

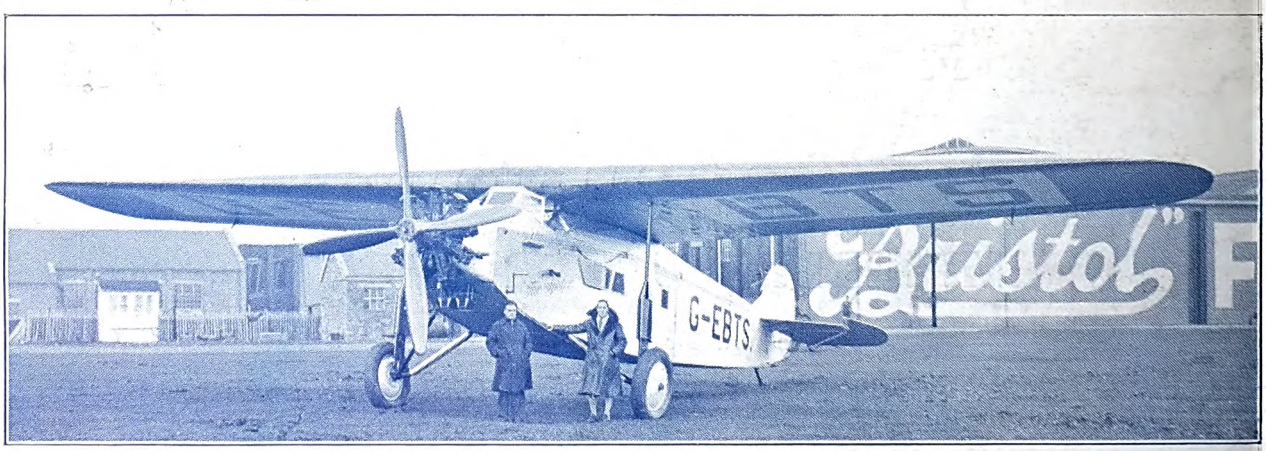
"Engine ran perfectly. Some harrowing take-offs boggy ground but absolutely no anxiety throughout flight. No adjustment made whatever. Congratulations.

Barnard."

ENGLAND TO CAPETOWN IN TEN DAYS WITH A "Bristol" JUPITER ENGINE

CAPTAIN BARNARD'S TRIBUTE TO THE "BRISTOL" JUPITER.

"The Spider monoplane made a safe landing yesterday on the aerodrome here (Capetown) just ten days after leaving Lympne. The Duchess of Bedford, Bob Little and myself have therefore the satisfaction of knowing that we have traversed the 9,500 miles of our journey quicker, by a substantial margin, than any human being before us. **We owe this achievement to a large degree to the splendid functioning of our 500 h.p. 'Bristol' engine,** and Little's skilful navigating of the route."—*Cable to "Daily Express," April 22nd, 1930.*



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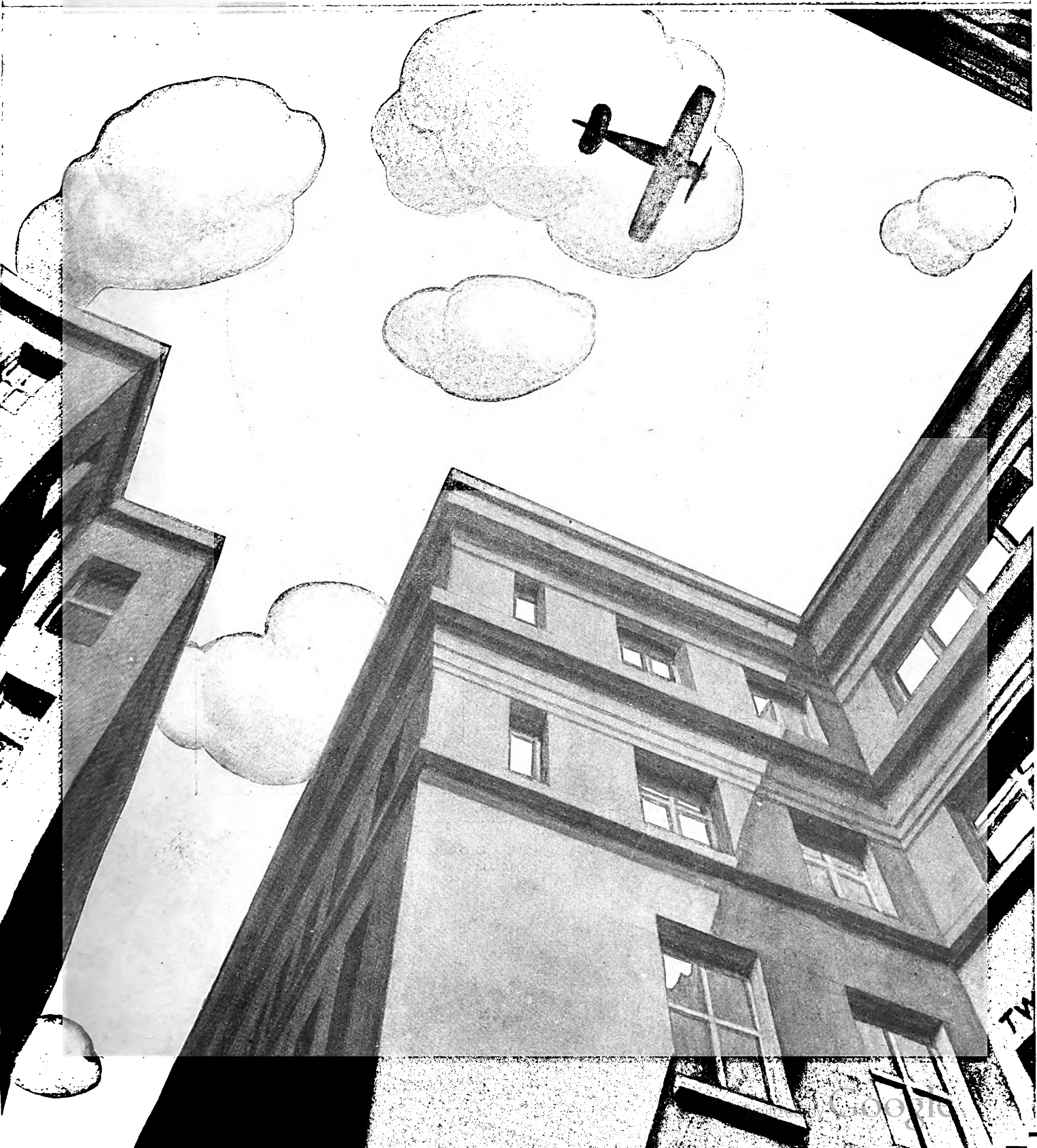
6d. Weekly.

Edited by C.G.Grey

INCORPORATING AERONAUTICAL ENGINEERING



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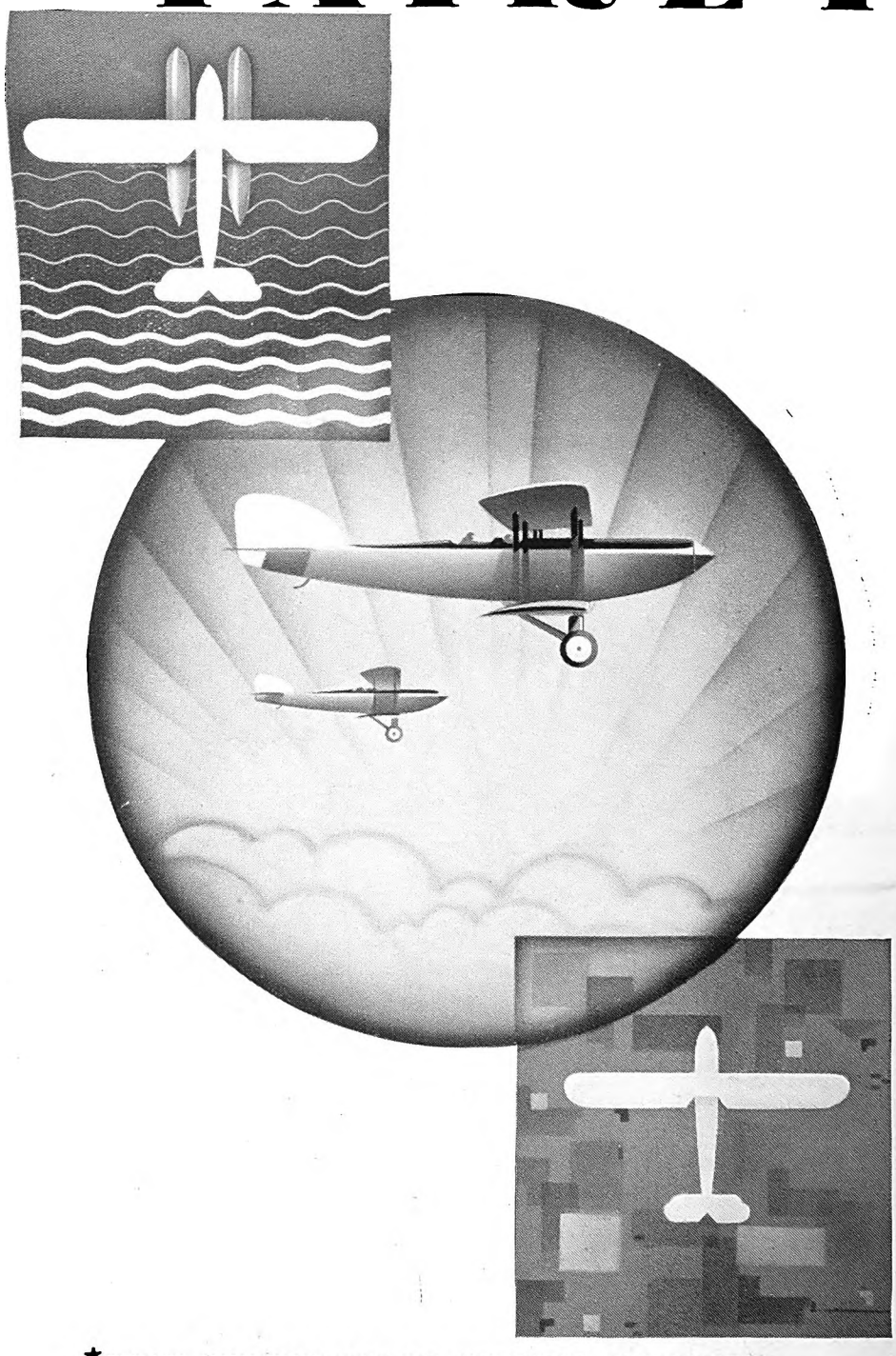

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are not actually State-owned, are on the whole, very much slower than they were 20 years ago, when they were in direct competition with one another and actually ran races from London to Scotland.

The additional speed of the Duchess of Bedford's flight to India and back, therefore, probably merely represents the difference between a private enterprise and a State undertaking. In using the word "undertaking" one does not necessarily imply that any State enterprise would be better dead and buried, but perhaps the fact bears that implication, and if so, let it stand.

Prospective Competition.

Be that as it may, the flight to India and back did demonstrate the speed at which our Indian mails might reasonably be carried. And no doubt, in due course, they will be carried at such speed, especially when a little competition with our Imperial Service arises as it is likely to do very soon.

One hears already that two or three well-to-do operators have the idea of running what they are pleased to call, "pirate 'buses" from London to various points on the Continent, directly in competition with Imperial Airways. And from several fairly reliable sources one has heard that the famous Nairn Motor Transport firm, which for some years has been running a motor-car service across the Desert from Palestine to 'Iraq, intend very soon to start an aeroplane service across to Baghdad and Basrah, also directly in competition with Imperial Airways. And, as we know, competition is always good for trade.

The reasons why competition is good for trade are several. The first, and perhaps the most important, is that so long as one person or one firm has a monopoly in any line of business, the firm or person so favoured is rather apt to go to sleep, especially if protected by a tariff-wall or a subsidy. As soon as a competitor appears, then the first favoured person has to wake up and do something really strenuous, especially if the competitor happens to be peculiarly energetic or restless.

The second reason, which is very nearly as important, is rather a matter of mass psychology. If one person tries to sell you anything, you stop to consider whether you shall buy it at all. If half a dozen people try to sell you half a dozen different types of the same thing, the question you then ask yourself is not, "Shall I buy it?" but "Which shall I buy?"

Consequently, if one firm is trying to sell air transport to a nation, or to one particular community, then that firm has to convince the community that air transport itself is a thing to be taken seriously. But if there are half a dozen forms of air transport available, then the community merely has to make up its mind which particular air transport it will use.

Considering air transport in that light, the more competition that is put up by enterprising capitalists, the better things generally will become for everybody concerned with aviation, even though the people who will benefit the most will be the new competitors and our excellent Imperial Airways—if they too move with the times and accelerate their services to compete with the newcomers.

The Lesson.

Though Her Grace of Bedford is in no wise a competitor with Imperial Airways, she will have done that organisation a great service if those responsible will profit by it. For she has shown the Directors of Imperial Airways the kind of competition with which they will have to compete within the next twelve months. And if they are wise, these same directors will take steps forthwith to separate entirely their mail service from their passenger service.

By her flight to India and back the Duchess of Bedford showed that without the slightest real trouble Indian mail can be flown from London to India in less than three days, so that, with adequate air connection at the other end, letters ought actually go to Delhi or Calcutta in three days, and, allowing 24 hours for a reply, the answer could be back in England in a week, all told.

Her flight to the Cape and back likewise showed that letters can be sent to Cape Town in less than a week, and that the answer can be back in England inside of a fortnight,—which is just about the time which letters now take to get from England to the Cape by steamer.

Speeding Up.

Moreover, these times only entail flying by day, and flying with aeroplanes which are quite readily available at the moment. The Duchess of Bedford's old Fokker monoplane is very nearly a genuine antique, as aircraft go. The Jupiter engine was the only fairly modern thing about it. And a glance at the broadside photograph which appears herewith, shows that the engine was attached to the aeroplane in a most primitive manner, and that it did not include any of the refinements of modern practice, such as Townend rings or N.A.C.A. cowling, which in themselves would put speed of the machine up anything from 10 to 15 miles an hour.

In fact, there is no reason whatever why our mails should not be flown from England to India, or as a matter of fact, from England, across India to Australia, as well as from England to the Cape, at an average speed of 150 miles an hour.

Nearly a year ago, Mr. C. M. Keys, of National Air Transport, told one that he was then organising things so that the American mails would be carried between New York and San Francisco at an average speed of 150 miles an hour. And there is every reason why British Imperial mail should be carried at a similar speed.

At least two mail-carriers with a cruising speed of 150 miles an hour could be bought for the price of one twenty-seat passenger-carrier,—let alone the forty-seaters which are now being built for passenger traffic.

Even if for the safety of His Majesty's Mail, over some of the desert country which they have to cover, the Post Office insisted that Imperial Airways should use two-engined machines, there is no reason why small and very fast twin-engined aeroplanes should cost very much more than a comparatively large single-engined high-speed aeroplane.

At the present moment Vickers Ltd. are actually producing twin-engined aeroplanes which have the performance needed.

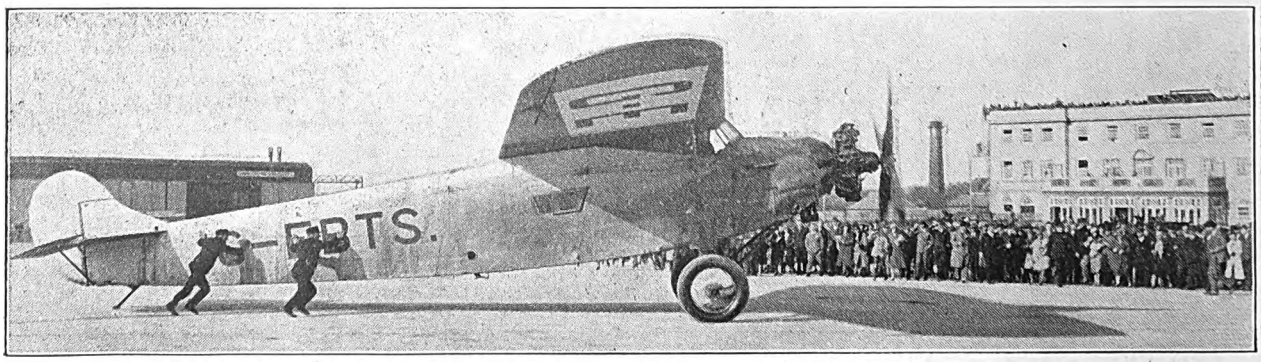
About the only objection to them for such work is that their carrying-capacity is bigger than anything that is now likely to be needed for such a mail service. That one objection would remove itself in a very short time when people began to find out the advantage of regular delivery of mails in a very short time.

Also Saunders-Roe Ltd. are actually building for Mr. Gordon Selfridge, Junior, to the designs of Sir Henry Segrave, a small fast twin-engined cabin machine which, with slight modifications and slightly more powerful engines, would do very well for just such mail-carrying work. And the Gloster Company have shown us that a two-engined machine *can* be built to fly on one engine.

Night Flying.

With proper high-speed mail-carriers there is no reason why the mails should not be flown at night over our Imperial Air Routes just as they are being flown across the United States. With our reliable engines and two, or possibly three, of them there is no need for the elaborate system used by the United States, where they have, or at any rate had some six years ago, a lighted landing-ground every three miles. With our modern machines, a landing-ground every 50 miles, or even every 100 miles, ought to be enough for night flying.

Only the other day a three-engined Avro-Five belonging to Imperial Airways was flying over bad country in Central Africa, when an air-screw broke, and before it could be



SHOWING HOW.—The ancient Fokker (Jupiter geared engine) arriving at Croydon after going to Cape Town and back in 21 days,—a good lead for our Imperial Airways.

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RELIABILITY OF BRITISH AERO ENGINES

The British aero engine has deservedly established a high record for reliability all over the world, the result of the exceedingly high standard of workmanship insisted upon by British firms. One outstanding example in the experience of Imperial Airways is the behaviour of 14 Napier Lion engines which have now been flown an aggregate of nearly 3,750,000 miles—the equivalent of flying 150 times round the world. One engine alone has covered 350,000 miles and is still in service, and this illustrates the economy and life of a first-class engineering job combined with a high standard of day-to-day maintenance

The Times,
8th April, 1930

Fit the engine of
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from the Duchess of Bedford's flight. In her first attempt on the flight to India, the engine of her machine gave out at Jask because of over-heated oil. In her flight to the Cape and back, a forced landing had to be made only a day's flying from home on the return journey because of over-cold oil. Now both of those accidents were of a kind which could hardly have happened on an organised air-line. The initial trouble which caused the forced landing in each case, would never develop if the ground organisation of the air-line were anything like what it ought to be.

One of the most important points about running an air line, whether it be for passengers or for mails, is that no machine ought to be asked to do more than a five-hour flight without a rest and full inspection and overhaul.

At the present moment, with such machines as we now use, that represents a 500-mile flight at the outside. With such machines as there ought to be already it would be a matter of 750 miles.

The present system of using the same machine for a 1,000 miles or more at a stretch with a mere landing and a brief inspection of the outside working part, is simply asking for trouble. The only wonder is that, especially on the Cairo-Karachi route, Imperial Airways have got away with so few accidents and forced landings.

Naturally we never hear of the ordinary uneventful forced landings and we hear practically nothing of minor accidents in which nobody is hurt. And the natural assumption is that a certain number of such accidents do happen. But all who are at all closely concerned with aviation do know that there is nothing unusual in starting a machine out from Cairo and flying it all the way to Karachi and back with no more overhaul than is possible between scheduled stops. The results reflect the greatest credit on the skill and industry of the Middle East ground engineers.

Still worse is the custom of sending one pilot the whole way to Karachi and making him fly the same machine back again with about only a stop of a day or so. One has heard of pilots doing twelve hours' flying in a day to keep up to schedule, after time has been lost through sandstorms or something of that sort, coming in late at night to Cairo, and then going out with another machine next morning.

One's own idea, based on experience of at any rate some dozens of pilots, is that the proper way to run an air line is to keep one pilot on one route covered in not more than five hours, and to keep him flying backards and forwards on that route till he knows every stick and stone on it. Then, in case of a forced landing he knows exactly where he can put his machine down and where he cannot.

No pilot can remember every possible landing-place on a route of a couple of thousand miles. But he can do it on a 500-mile route, and an air-line pilot ought to know his road as well as does a London 'bus-driver.

The Increased Subsidies.

All the foregoing are merely various points which occur in a general consideration of Imperial air transport. And they are commended to the attention of all who are concerned with this line of business, which, if properly developed, will be in a few years at least as big a business as is our shipping trade.

The subject deserves particularly serious consideration at present, because of the Air Transport (Subsidy Agreements) Bill, which is apparently to be introduced in the House of Commons. A Memorandum explaining the financial resolution was issued a fortnight or so ago,—without date. This is in the form of what is commonly called a White Paper. Officially it is Command No. 3546, and it reads thus:—

AIR TRANSPORT (SUBSIDY AGREEMENTS).

Memorandum explaining the Financial Resolution.

1. The Resolution authorises the President of the Air Council to agree, with the approval of the Treasury, to pay subsidies to any persons and to furnish facilities for their aircraft, in consideration of those persons maintaining in accordance with the agreement a regular service for the carriage by air of passengers, goods and mails.

Any sums required by the President for the fulfilment of any such agreement will be paid out of moneys provided by Parliament.

It is provided that the aggregate amount of the subsidies payable under all such agreements shall not exceed £1,000,000 in any financial year; and that no subsidy shall be payable under any such agreement after the 31st December, 1940.

2. The figure of £1,000,000 represents the maximum *gross* liability which may be incurred by the President in any financial year under all such agreements entered into by him, whether on behalf of His Majesty's Government in the United Kingdom solely or on behalf of that Government jointly with one or more other Governments of the Empire. In the latter case any contributions which may be made by the other Governments towards the cost of the subsidy will be appropriated in aid of Air Votes; and the net liability on United Kingdom funds will be correspondingly reduced.

3. It is estimated that the gross charge falling upon Air Votes in the financial year 1930 will be £428,000. This sum includes the subsidies payable to Imperial Airways, Limited, in respect of the European and England-India air services, and of the commencement of the projected African air service. The net liability on the United Kingdom Exchequer in 1930, after taking credit for the contributions of other Governments towards the African service, is estimated at £408,000. The corresponding figures for the financial year 1931 are estimated at £550,000 gross and £378,000 net, on the assumption that the African service will then be in full operation.

4. The existing and projected subsidies are on descending scales; consequently the figure of £1,000,000 gross should allow a reasonable margin for any further subsidised services that may hereafter be approved during the period to which the Resolution applies.

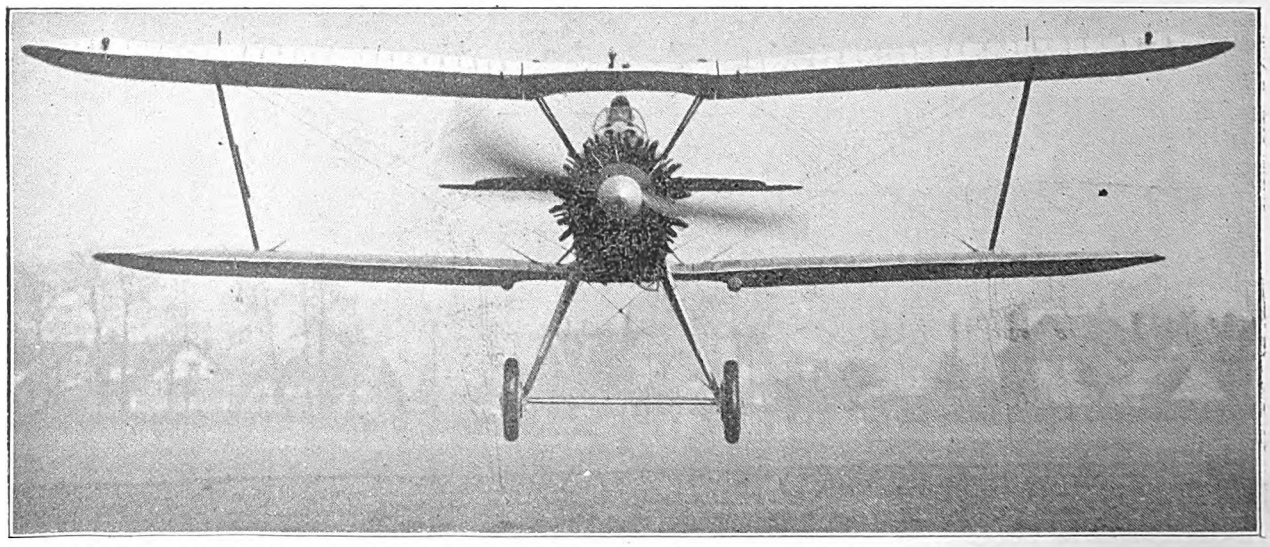
Under this Bill, as may be seen, the President of the Air Council, who is the Air Minister for the time being, is authorised to pay out subsidies up to the amount of one million pounds in any financial year, up to the end of 1940. This amount is evidently exclusive of subsidies already agreed to flying clubs and to National Flying Services Ltd. As may be seen it applies only to "regular services for the carriage by air of passengers, goods and mail."

To Whom the Subsidy?

This raises a very interesting question. Hitherto whenever any prospective air-line operator has approached the Air Ministry about getting a subsidy, he has been told that all the subsidy available is allocated to Imperial Airways Ltd and that any further subsidy voted will also be applied to the use of Imperial Airways Ltd.

If this memorandum be read aright, the Government will be free in future to subsidise other air-lines besides Imperial Airways. Presumably the subsidy will not be given to lines which propose to compete directly with any of the Imperial Airways route. That would obviously be foolish,—for, no matter how much Imperial Airways might be enlivened and enlightened by keen competition, the Government, even if Socialists, would hardly be justified in asking the taxpayer to finance two competitors in a price-cutting war. We have hardly yet reached such a degree of subtlety in our political affairs as deliberately to achieve the survival of the fittest by paying people to cut one another's throats.

Be that as it may, we have in this Air Transport Bill some hope for enterprising capitalists who are ready to



A DECK FLIER.—The Gloster Gnatsnapper (Jaguar VIII) Single-Seat Fleet Fighter.—(*"Aeroplane" photograph.*)

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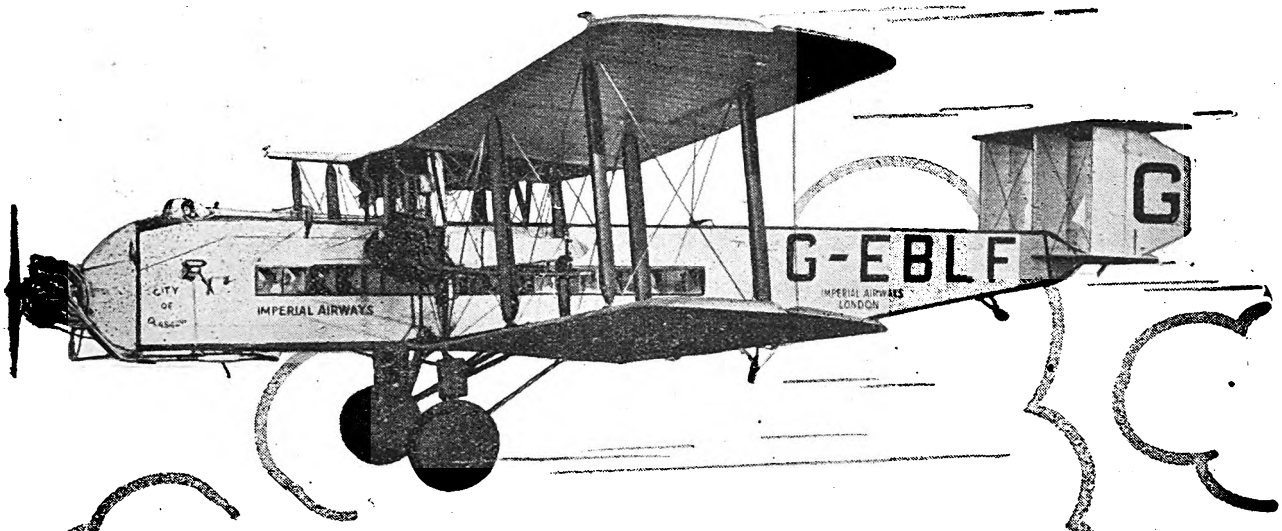

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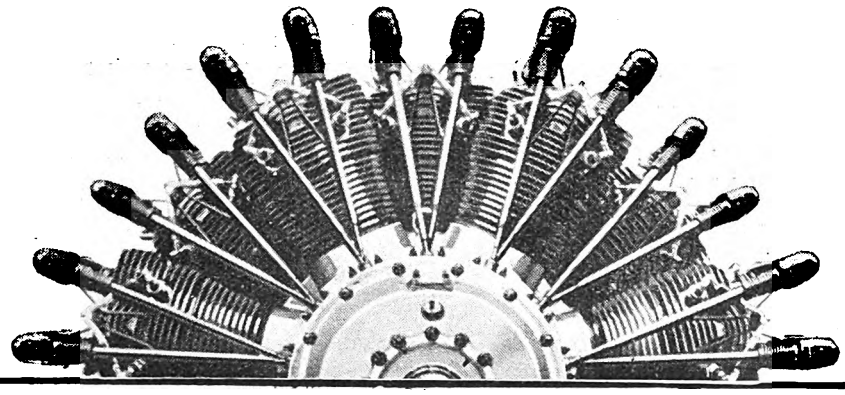

AUSTRALIA uses Genet, Genet Major, Mongoose, Lynx, Jaguar.
NEW ZEALAND uses Jaguar.
CANADA uses Genet, Genet Major, Lynx, Mongoose, Jaguar.
SOUTH AFRICA uses Genet, Genet Major, Lynx, Jaguar.
INDIA uses Jaguar, Genet Major.
IRELAND uses Genet.
EGYPT uses Jaguar, Genet Major.
FRANCE uses Genet, Genet Major, Lynx.
GERMANY uses Genet, Lynx, Jaguar.
BELGIUM uses Lynx.
SPAIN uses Lynx.
HOLLAND uses Mongoose, Lynx, Jaguar.
SWEDEN uses Mongoose, Lynx, Jaguar, Leopard.
AMERICA uses Genet, Genet Major, Jaguar.
ARGENTINE uses Mongoose.
BRAZIL uses Lynx.
CHILE uses Lynx.
ESTHONIA uses Genet Major, Lynx.
LATVIA uses Lynx, Jaguar.
JAPAN uses Mongoose, Lynx, Jaguar, Leopard.
DUTCH EAST INDIES uses Lynx.
IRAQ uses Jaguar.
MALTA uses Jaguar.
DENMARK uses Lynx, Jaguar.
ITALY uses Lynx.
RUSSIA uses Jaguar.
POLAND uses Genet.
GREECE uses Lynx, Jaguar.
SWITZERLAND uses Lynx.
ROUMANIA uses Jaguar.
SIAM uses Lynx.
SINGAPORE uses Genet Major.

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goods and mails, within the British Isles. In the first place, all such work as may be needed can be done quite well by enterprising air-taxi firms. And in the second place, a regular air service cannot be run in this country north of Crewe, during the late Autumn and the Winter.

Personally, one agrees now more firmly than ever with Mr. Winston Churchill's dictum that Civil Aviation must fly by itself. But if there is any subsidy money going one can only hope that it will be allocated to new and enterprising firms who will open up in fresh directions, not necessarily within the Empire, but in directions where business can be developed. Trade within the Empire is all very fine as a political slogan, but trade is trade, and profit is profit, wherever the money comes from.

In these days when poor Australia, ridden to death by Trade-Unions and Socialism, cannot make enough money out of her exports to pay for her imports, and so has to forbid her merchants to pay out of the country the money they owe, there is little enough immediate profit to be got out of an air line to Australia. And in these days when the coloured folk of India are allowed by a weak or disloyal Indian Government to assault and massacre English women and men, there does not seem to be much good to be got out of the Indian air mail. So our financiers who are thinking of organising air lines, and hope to loot some of this subsidy may well look out for air routes which are also trade routes and not merely strategic air lines.—C. G. G.

THE AIR TRANSPORT BILL.

In the House of Commons on May 5, Mr. Montague, Under-Secretary of State for Air, moved the following resolution on which to found the Air Transport (Subsidy Agreements) Bill:—

That it is expedient to authorise the President of the Air Council to agree, with the approval of the Treasury, to pay subsidies to any persons and to furnish facilities for their aircraft, in consideration of those persons maintaining in accordance with the agreement a regular service for the carriage by air of passengers, goods, and mails, and to authorise the payment out of moneys to be provided by Parliament of any sums required by the President for the fulfilment of any such agreement:

Provided that the aggregate amount of the subsidies payable under all such agreements shall not exceed £1,000,000 in any financial year, and no subsidy shall be payable under any such agreement after December 31, 1940.

The following précis of the debate is taken, with due acknowledgment, from *The Times*, as *Hansard* was not published in time to deal with the discussion before THE AEROPLANE had to go to press:—

Mr. Montague said that the reason for the resolution and the Bill was that after full consideration it had been found desirable that the Secretary of State for Air should in future have statutory authority to make long-term agreements for air transport services entailing the payment of subsidies. This had been found necessary all over the world for civil aviation in its present state. A number of agreements had been made in the past and would be made in the future, notably in connection with the air service to South Africa, which it was hoped to institute before the end of the year, and in connection with an extension of the air service to Australia, which was now under discussion with the Government of Australia.

SIR S. HOARE said that the resolution and the Bill seemed totally unnecessary, and were a work of departmental pedantry. Since the Exchequer grants were first made for civil aviation five long-term agreements had been made, and no one had ever suggested that further authority was needed by the Government. He would have thought that the Government had quite enough on their hands, but assuming that this resolution and the Bill were necessary, he would not oppose it. The only agreements worth anything at all were long-term agreements, and they should be made on a descending scale so that firms were encouraged to make their services independent. The sum of £1,000,000 a year during the next ten years might seem large, but was really quite modest compared with the expenditure on civil aviation in foreign countries. France was spending three times as much as us, Germany twice as much, and the United States seven times as much. The real test to apply to this expenditure, however, was not the amount of money to be spent, but rather such tests as efficiency, safety, and regularity of service. He was glad to think that year by year our civil aviation was becoming less dependent on Government subsidies. That being so, he very much hoped that during the next ten years—the time in which this money would be spent—we should see our aeroplane services self-supporting, and, so far as airships were concerned, he hoped that during the period in which the grant would run, they would see a commercial airship service of some kind operating between this country and other distant countries.

LT.-CDR. KENWORTHY said he was anxious that too much money should not be spent on subsidies to airships at the expense of the heavier than air machines for carrying passengers and mails to distant parts of the Empire. He did not believe that civil aviation in this country would ever come into its own so long as it was under the Air Ministry as at present constituted. It was bound to be overshadowed by the military service. He thought it would be better to place civil aviation under the Ministry of Transport.

SIR E. HILTON YOUNG hoped that the Government would not introduce into the Air Ministry the obsolete and elaborate system which existed in regard to contracts made by the Post Office.

SIR A. SINCLAIR said that this country was only sixth or seventh in respect of the mileage of its air routes although it led in aeroplane design and the art of flying.

MR. MATTERS hoped the Minister for Air would consider the question of separating civil and military aviation.

CAPT. BALFOUR said that the Imperial Airways agreement had another eight years to run and he could not see that there was much prospect of making that company a self-supporting economic proposition when the agreement had expired.

MR. MONTAGUE, replying to the discussion, said that as to the question of constitutional usage, agreements had been made in the past without statutory authority for the period of the agreements, but in future agreements would be made under statutory authority for the full period whatever change in Government or in Parliament there might be. In regard to the provision that the subsidies were not to exceed £1,000,000 in any financial year, that did not mean that the full amount was likely to be expended in any single year. He only wished there was such a prospect, in the interest of civil aviation. This year the total amount of the subsidy paid to Imperial Airways was £335,000. Subsidies, in fact, were diminishing. Appropriations in aid had also to be taken into account in relation to subsidies. In relation to the expenditure that would be incurred for the South African service there would be appropriations in aid from the South African Government and other Governments concerned in the areas which the service would cover. It would be possible to give subsidies for the commercial development of airships.

It was not strictly correct to say that this country was seventh in order of aerial mileage. Taking Imperial services as the basis of comparison, this country was not seventh but second. The total number of British Imperial aerial miles flown was 20,850, without taking into account the projected South African service. That was the second largest, the first being the United States, with 46,622 miles. France came next with 17,500 miles, and then followed Germany with 16,500 and Italy with 7,803. Our standards of efficiency in aircraft manufacture, and, what was most important, our standards of safety, bore very favourable comparison indeed with similar standards in any other part of the world.

No one regretted more than he did that it had been impossible so far to find a solution of the problem in the West Indies. It was a problem which had to do not only with Air Ministry initiative, but with the whole question of finance. It was a matter of inter-Imperial communications, and not of Imperial communications, and, that being so, it was necessary that there should be interest to the extent of practical and financial assistance coming from the Colonies concerned. There was not much prospect of that at present. The Colonies were poor with the exception of Trinidad, and even so far as Trinidad was concerned there was not much chance of obtaining any financial support at present. That did not mean, however, that the Air Ministry was leaving anything undone that could be done in order to get aviation services going in the West Indies. On the contrary, they were doing everything possible. They had an eye, also, on the larger, the Imperial, issue of the relations between Canada and South America.

Military aviation did not control the policy or the work of the civil aviation side of the Air Ministry. From the standpoint of research, of design and structure, and of ground organisation, military and civil needs were almost precisely the same. They could not, at the present moment, be separated. The whole thing was one, and it would be, not only unwise, but disastrous, for civil aviation if it were taken away from direct association with military needs. So far as the industry was concerned, it would be true to say that, but for military needs, there would be no civil aviation industry at all in this country. The industry depended on the demand for military machines, and in the actual conditions of the production of craft the two sides were inextricably mixed and could not, with any advantage, be divided at present, whatever might be the possibility in the future. He could assure hon. members that there was no actual interference by the military side with the fullest possible development of civil aviation.

The Air Ministry had in mind war possibilities. That was part of the business of the Air Ministry. Aerodromes were serviceable in time of war; pilots were necessary in time of war; particular kinds of planes were required. How far airships or the ordinary commercial plane might be adaptable he did not know. But an Air Ministry must have these things in view. It must take account of the fact that routes were probably not only commercial but strategic when they were considering the subject of potential war, but that was not the same thing as saying that war policy or war ideas governed the question of aviation from the Ministry side so far as commercial development was concerned.

With regard to the route *via* Athens to Alexandria, the negotiations were still being continued with the Italian Government, and it was expected that before long a satisfactory arrangement would be made for a route to be undertaken *via* Corsica and Naples.

The resolution was agreed to and reported to the House.

LIEUT.-COL. MOORE-BRABAZON.

Lieut.-Col. J. T. C. Moore-Brabazon, a pioneer of Aviation, who has been Member of Parliament for Rochester since 1918, but was defeated in the last election, has decided not to contest the Division again. All will hope that his abounding energy, foresight, and imagination, may be turned to some more useful object than trying to elevate obtuse Members of Parliament. His coal-carbonisation business ought to provide more employment than ever Mr. J. H. Thomas has provided.

THE LATE COUNT DE LA VAULX.

The funeral of the late Count de la Vaulx, the President of the *Fédération Aéronautique Internationale*, took place in Paris on May 2. The Royal Aero Club was represented by Group Captain R. J. Bone, C.B.E., D.S.O., the British Air Attaché in Paris.

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FOR THE WORLD'S AIR LINES

The Avro 10 is gaining more and more the confidence and respect of the world's air lines. It is remarkably independent of climatic conditions, and the full weight of the tropic sun no more affects it than the frozen skies of the north. It is equipped with three 230 h.p. Armstrong Siddeley engines and is entirely British built to the Air Ministry's standard of air-worthiness and safety. Particulars of this and other Avro machines will be supplied on request.

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The sole English distributors for the Avian light aeroplane are Henlys (1928) *Ltd., Heston Air-park, nr. Hounslow. Hayes* 410.

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LORD TRENCHARD.

A *Reuter* message from New York on April 29 states that Marshal of the Royal Air Force Lord Trenchard has been elected a Director of the Goodyear Tyre and Rubber Company.

The Goodyear Company is one of the greatest rubber firms in the World and has branch factories in all industrial countries. The British works are at Wolverhampton. Though the Headquarters are at Akron, Ohio, U.S.A., the firm is very much international in character,—like the great oil firms,—and the fact that England controls the World's rubber market emphasises its internationalism.

The particular aeronautical interest of the firm lies in the fact that it is the parent company of the Goodyear-Zeppelin Corporation, whose immense shed at Akron was illustrated in this paper last week. Compared with this, the Air Wheel, of which so much has been heard lately, is a comparatively minor undertaking, in spite of the important part it is likely to play in the future development of aeroplanes, and particularly of amphibians.

Those who have followed Lord Trenchard's public utterances intelligently will remember that a few years ago he expressed his faith in big airships, not only as passenger-carrying vehicles, but as probable aircraft-carriers in time of war. This statement of his may perhaps provide the clue to an alliance, which might at first sight seem inexplicable, between one of this country's most distinguished public servants and a purely commercial concern with international interests.

THE RETURN OF "THE SPIDER"

On Wednesday, April 30, the Duchess of Bedford's Fokker monoplane, *The Spider* (Bristol Jupiter) finished yet another section of its far-flung web when it was landed at Croydon by Mr. C. D. Barnard at the end of 18,500 miles of flying in less than 21 days. The return journey from Cape Town took one day more than schedule owing to an oil-lock which forced a landing in the mountainous country about Dragoman, 30 miles north-west of Sofia, which was the point mentioned in last week's issue of THE AEROPLANE.

The sporting help of the Bulgarian Air Authorities enabled Her Grace, Mr. Barnard and Mr. Robert Little to make repairs and continue their flight only one day late. After starting again from Sofia at an early hour *The Spider* was not definitely signalled until it passed Lympne about 05.00 hours that evening. However, friends in England had been told that there was 18 hours' supply of fuel aboard, so they went to Croydon at tea-time nothing doubting that bouquets would not fade in disuse nor welcomes grow cold with waiting.

When the weather-beaten Fokker appeared—after several false alarms caused by the appearance of distant monoplanes which turned out to be only Desoutters, a Moth III and a Rohrbach of the Luft Hansa—the crowd became both animated and incoherent. The usual phalanx of photographers formed a parasitic attachment to the little band of welcomers and welcomees, and the earnest high-priest of a "talkie" unit, with tears in his voice, besought the Duchess to say words appropriate to such a home-coming and the crowd to do a little corroborative and realistic cheering. When the performance had been repeated for the benefit of a microphone that was either hard of hearing or only intermittently functional, he thanked Her Grace, but addressed her by the name of another famous British aviatrix!

The equipment for the flight, without exception, receives the highest praise from Mr. Barnard, the chief pilot, and Mr. Little, second pilot, navigator and engineer. The ancient Fokker looked travel-worn on its arrival, and there can be few machines with so good a right or such a chequered past.

The Bristol Jupiter engine also showed the stains of tropic rain and various vicissitudes, but the travellers say that it ran steadily and perfectly throughout the gruelling test, finishing even stronger than it started.

Special Shell petrol and Golden Shell oil were used throughout, and supplies were produced promptly in the queerest spots by Shell representatives.

Mr. Barnard and Mr. Little used Stanford's maps and give them warm approval for their neat arrangement.

Dunlop patent disc wheels and wired-type tyres came triumphantly through landings and take-offs on every type of ground, even the last descent among the mountains of Bulgaria with a tremendous load.

K.L.G. plugs were used, "of course," in the proper sense of that overworked expression, and never missed a spark.

The Lord Thomson, Secretary of State for Air, sent the following telegram to the Duchess of Bedford:—

On behalf of the Air Council, I send you, Captain Barnard and Mr. Little warm congratulations on your great flight to Cape Town and back. The completion of a journey of 19,000 miles in less than twenty-one days affords yet another illustration of the benefits air transport holds in store for the Empire in speeding up communications and thus facilitating intercourse between the Dominions and the mother country. We regard with admiration the spirit of enterprise which prompted you to embark on the undertaking which you have to-day brought to so successful an issue, despite the difficulties you have encountered.

IN THE MIDDLE OF THE WEB.

The Duchess of Bedford's famous veteran Fokker monoplane *Spider* (Jupiter engine) is on view during this week to the general public on the Island Site just opposite St. Mary's-le-Strand. Shell-Mex Ltd. arranged the exhibit to draw eminently justified attention to the fact that the 18,500 miles were flown on special Shell petrol and Golden Shell lubricating oil. They have got Mr. Robert Little to superintend their show and to be a walking encyclopædia,—for which rôle his part in the flight qualifies him admirably. As navigator, engineer and second pilot to Mr. C. D. Barnard, Mr. Little's performance was as remarkable as anything to do with the whole astonishing achievement.

The enterprise and ingenuity of Shell-Mex Ltd. can be judged by the site chosen for their exhibition. The monoplane was not flown there, despite the apparent impossibility of all other avenues of approach. The 63 ft. wing and the undercarriage were removed and reassembled *in situ* after taking as long on the journey from Croydon as this machine usually requires to cross a continent or two. Purposely, and rightly, the stains of travel are untouched; and the mud and oil of many latitudes are eloquent of the week-in, week-out performance as contrasted with a mere trans-oceanic flight.

SIR PHILIP SASSOON.

Sq. Ldr. the Rt. Hon. Sir Philip Sassoon, Bart., G.B.E., C.M.G., M.P., Officer commanding No. 601 (County of London) (Bomber) Squadron, Auxiliary Air Force, who was Under-Secretary of State for Air in the last Government, flew to Oxford on May 1 to receive his B.A. and M.A. His aeroplane landed on the aerodrome of the Oxford University Air Squadron.

The degrees were conferred over twenty years ago when Sir Philip was at Christ Church.

COSTLY HABITS.

On May 5 a French freight-carrying air liner, which had landed at Berck on its way from Le Bourget to Croydon owing to bad weather, was ransacked during the night and a number of latest Paris models disappeared. If the aeroplane is to keep its reputation as an ideal means of transporting valuables air lines must cultivate a new attitude towards the serious things of life. A closer watch on the Parisian modes will mean money in their pockets.

MAKING SURE OF IT.

On May 5 M. Laurent Eynac, the French Air Minister opened the Congress of the National Aeronautical Federation at Oran, Algeria.

He and his party flew to Oran from Algiers in the Short Calcutta flying-boat (three Bristol Jupiter engines) which was recently bought by the French Air Ministry.

IMPORTANT DATES.

May 7.—Air League Dinner and Ball.
May 9.—De Havilland Technical School Dance.
May 10.—Athletics. Triangular Tournament: R.A.F.C., R.M.C., and R.M.A. at Woolwich.
May 10.—N.F.S. Meeting at Leeds.
May 10.—Air Rally at Parnham Country Club, Beaminster.
May 15.—Dinner to Lord Wakefield by the R.Ae.S., the R.Ae.C., the S.B.A.C., and the Air League.
May 17.—Brooklands Flying Display and opening of Brooklands Aero Club.
May 29—June 14.—Royal Tournament at Olympia.
May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support).
June 7.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—R.A.F. Garden Party at Manston.
June 19.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gywnn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
July 3.—Indian Empire Garden Party at Hurlingham.
July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).
July 9—12.—R.A.F. Athletic Championships at Uxbridge.
July 13.—N.F.S. Meeting at Leeds.
July 19.—N.F.S. Meeting at Hull.
July 20—Aug. 7.—International Touring Competition, starting from Berlin.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at the Hague.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

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ANOTHER RECORD FLIGHT

THE DUCHESS OF BEDFORD AND CAPT. BARNARD

relied for oil and petrol on

SHELL

The Jupiter-engined Fokker Monoplane "Spider," which has flown from England to Capetown and back in 20 days, used

"Golden Shell" Oil, and petrol (specially prepared for the flight, as is "Summer Shell" for motorists during the warmer weather) by

SHELL

Stuarts

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, Apr. 29.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—The following are granted S.S. comns. as Pilot Officers on probation with effect from and with seniority of Apr. 11:—J. W. P. Armitage, G. V. Barber, R. J. W. Barnett, C. F. Birks, G. A. Bolland, J. A. S. Brown, L. A. Bullard, R. G. E. Catt, R. N. Clarke, L. J. Crosbie, K. B. B. Cross, E. Dawson, A. E. Dobell, G. F. K. Donaldson, R. B. Harrison, H. O. Haughton, P. Haynes, E. J. N. Heaven, G. H. Leftwich, D. L. McAllister, D. W. Morrish, J. G. B. O'Hagan, A. E. B. Trappes-Lomax, J. L. M. White, G. M. Williams.

The following Pilot Officers on probation are confirmed in rank:—W. S. Monroe (Jan. 21); W. N. H. Banks, E. C. Durbin, A. C. Larmuth, F. A. Wardell (Apr. 2). Plt. Off. L. S. Tindall is promoted to the rank of Flying Officer (June 14, 1928), (substituted for the notification in the *Gazette* of Sept. 11, 1928); Flt. Lt. S. Nixon, O.B.E., is placed on the retired list and is granted permission to retain the rank of Squadron Leader (Apr. 30).

MEDICAL BRANCH.—Flg. Off. J. L. Groom, M.R.C.S., L.R.C.P., is promoted to the rank of Flt. Lt. (Apr. 2).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following Pilot Officers on probation are confirmed in rank:—G. P. Jewett (Apr. 19); F. M. Walker (Apr. 20); C. Langley (Apr. 21); T. H. Bevan (Apr. 23).

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE.

The following Sisters are appointed to the permanent service (Apr. 1):—Miss W. M. Cave, Miss O. A. Keyse, Miss A. M. Rodd, Miss F. M. Pepper, Miss E. M. Dowdeswell, A.R.R.C., Miss M. C. Rattenberry.

Appointments.

Week ending May 5, 1930.

GENERAL DUTIES BRANCH.—Squadron Leaders J. Noakes, A.F.C., M.M., to No. 5 F.T.S., Sealand, 22/4. A. S. Maskell, to R.A.F. Base, Calshot, 24/4. V. S. E. Lindop, to H.Q., R.A.F., Transjordan and Palestine, 15/4. H. G. R. Malet, to No. 2 A.C. Co., Palestine, 13/4. S. B. Harris, D.F.C., A.F.C., to No. 39 Sqdn., India, 4/4.

Flight Lieutenants W. D. Gairdner, D.F.C., to H.Q., Wessex Bombing Area, Andover, 27/4. J. T. Paine, to H.Q., 'Iraq Command, 3/3. D. H. Carey, to R.A.F. Depot, Uxbridge, 2/4. C. Feather, to No. 11 Sqdn., India, 24/3. E. E. Arnold, to No. 32 Sqdn., Kenley, 12/4. E. Burton, to H.M.S. Eagle, 23/4. J. M. J. C. J. I. Rock-de-Besombes, to R.A.F. Depot, Uxbridge, 12/4. R. W. E. Bryant, to No. 6 Sqdn., Middle East, 1/4. R. M. Davy, to Station H.Q., Heliopolis, 31/3. J. D. S. Denholm, to No. 1 Air Defence Group H.Q., 15/4. I. E. Brodie, to No. 43 Sqdn., Tangmere, 11/4. W. E. Symonds, to No. 58 Sqdn., Worthy Down, 13/4. W. F. Dickson, D.S.O., A.F.C., to H.Q., R.A.F., India, 4/4. J. Cottle, M.B.E., D.F.C., to No. 2 A.C. Co., Palestine, 12/4. G. P. H. Carter, to H.Q., R.A.F., Middle East, 14/4. J. Glover, to R.A.F. Depot, Egypt, 16/4. J. E. G-H. Thomas, to No. 1 (Indian Wing) Station, India, 5/4. L. R. W. Tillard, to No. 3 (Indian) Wing H.Q., 5/4. J. W. Turton Jones, to No. 3 Sqdn., Upavon, 25/3. M. S. Keogh, A.M., to R.A.F. Depot, Uxbridge, 25/3. B. Cheesman, M.B.E., to R.A.F. Depot, Uxbridge, 2/3. A. J. E. Broomfield, D.F.C., to A. and G. School, Eastchurch, 18/4. E. C. Barlow, to No. 1 F.T.S., Netheravon, 21/4. T. J. Desmond, to Station H.Q., Upper Heyford, 28/4.

Flying Officers W. Wheatley, to Home Aircraft Depot, Henlow, 14/4. R. C. Greenhalgh, to No. 15 Sqdn., Martlesham Heath, 15/4. A. K. K. Calwell, to E. and W. School, Cranwell, 31/3. H. S. Martin, to No. 27 Sqdn., India, 17/3. W. C. McNeil, to School of Naval Co-operation, Lee-on-Solent, 27/3. G. Francis, to Station H.Q., Hal Far, Malta, 17/3. A. T. C. Hazledine, to R.A.F. Depot, Uxbridge, 2/4. P. J. Conolly, to R.A.F. Depot, Uxbridge, 10/4. A. Wall, to No. 60 Sqdn., India, 18/4. H. L. Drake, to R.A.F. College, Cranwell, 23/4. B. W. Knox, to A. and G. School, Eastchurch, 25/4. C. S. Ellison, to Station H.Q., Duxford, 28/4. P. Coyle, to R.A.F. Depot, Uxbridge, 25/3. F. G. Fairhead, to School of Naval Co-operation, Lee-on-Solent, 10/4. J. S. Bromfield, J. E. Allen and J. J. Owen, to No. 1 F.T.S., Netheravon, 22/4. H. Bailey and V. S. Bowling, to No. 2 F.T.S., Digby, 22/4. D. Dickson, J. E. Markby and A. E. Dark, to No. 3 F.T.S., Grantham, 22/4. C. K. J. Coggle, K. F. T. Pickles, S. R. Groom and N. E. White, to No. 5 F.T.S., Sealand, 22/4. H. G. Hicks and J. H. T. Simpson, to R.A.F. Training Base, Leuchars, 22/4. J. A. H. Louden, to R.A.F. College, Cranwell, 23/4.

Pilot Officers A. M. Cowell, to 27 Sqdn., India, 17/3. M. V. de Satge, to R.A.F. Depot, Uxbridge, 25/3. P. B. Lusk, to No. 27 Sqdn., India, 17/3. E. M. Morris, to No. 1 School of T. T. (Apprentices), 24/4. E. R. M. Walker, to No. 12 Sqdn., Andover, 11/4. E. E. Ellison, to No. 4 Sqdn., S. Farnborough, 1/4. G. D. Fleming, to No. 10 Sqdn., Upper Heyford, 1/4. D. A. Messiter, to No. 41 Sqdn., Northolt, 1/4. H. R. Black, to No. 111 Sqdn., Hornchurch, 1/4. The undermentioned are all posted to R.A.F., Depot, Uxbridge, on appointment to S.S. Comns. as Pilot Officers on probation with effect from 11/4. J. W. P. Armitage, G. V. Barber, R. J. W. Barnett, C. F. Birks, G. A. Belland, J. A. S. Brown, L. A. Bullard, R. G. E. Catt, R. N. Clarke, L. J. Crosbie, K. B. B. Cross, E. Dawson, A. E. Dobell, G. F. K. Donaldson, R. B. Harrison, H. O. Haughton, P. Haines, E. J. N. Heaven, G. H. Leftwich, D. L. McAllister, D. W. Morrish, J. G. B. O'Hagan, A. E. B. Trappes-Lomax, L. J. M. White, G. M. Williams. E. C. Hudleston, to R.A.F. College, Cranwell, 22/4. D. P. Lascelles and R. W. Letchworth, to No. 5 F.T.S., Sealand, 22/4.

MEDICAL BRANCH.—Squadron Leader J. M. A. Costello, M.C., to No. 4 F.T.S., Egypt, 29/3.

Flight Lieutenants A. L. St. A. McClosky, to Palestine General Hospital, 27/3. B. W. Cross, to R.A.F. Depot, Uxbridge, 1/4. W. D. McKeown, to R.A.F. Depot, Uxbridge, 10/4. J. M. Ritchie, to No. 45 Sqdn., Middle East, 29/3. B. B. Kennedy, to Palestine General Hospital, 29/3. G. T. O'Brien, to R.A.F. Depot, Uxbridge, 10/4.

STORES BRANCH.—Wing Commander W. J. B. Curtis, O.B.E., to H.Q., Coastal Area, for Stores Staff duties, 22/4.

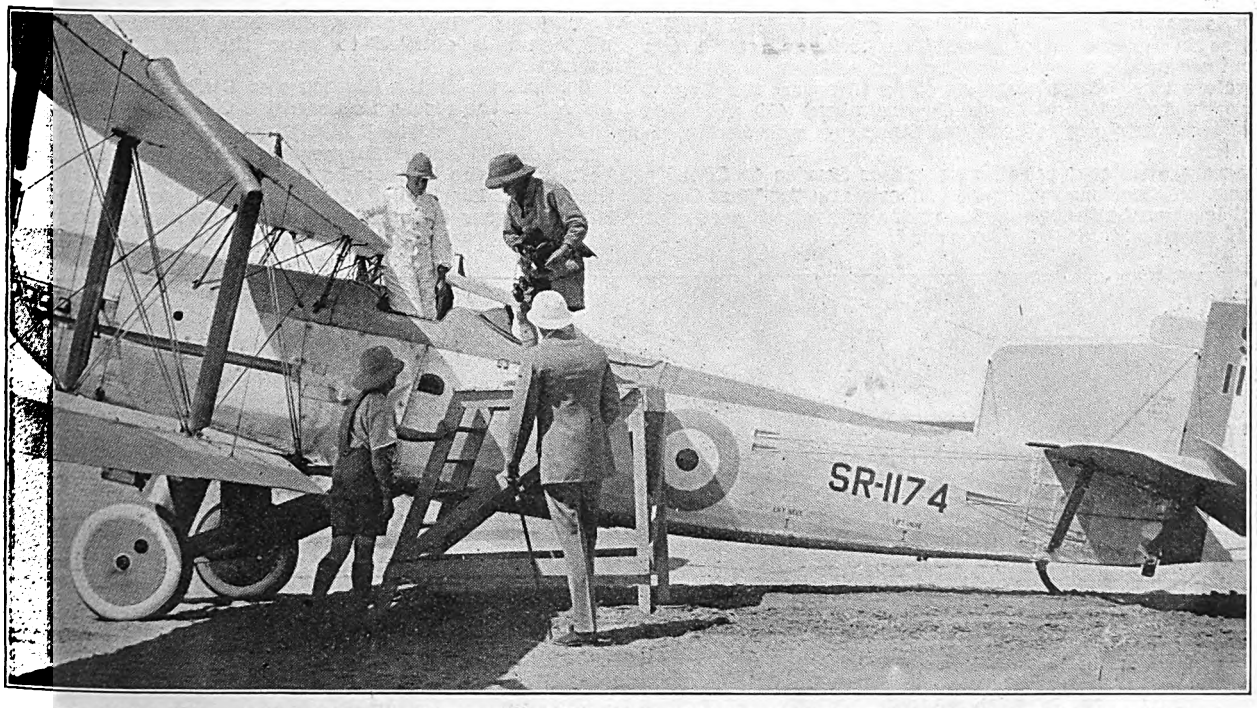
ACCOUNTANT BRANCH.—Flight Lieutenants F. O. Hall and E. V. Humphrey, to R.A.F. Depot, Uxbridge, 10/4.

Flying Officers R. W. Collinson, to No. 45 Sqdn., Middle East, 11/4. T. P. E. Campbell, to No. 216 Sqdn., Middle East, 27/3.

Pilot Officer K. Fraser, to Station H.Q., Andover, 13/4.

Air Warfare.

In the House of Commons on Apr. 30, Cmdr. Bellairs asked the Under-Secretary of State for Air what steps had been taken to ratify the rules for restricting aerial operations in war to military objectives, as agreed to by the International



SANS PEUR (The motto of No. 47 (B) Sqdn.).—H.R.H. The Prince of Wales alighting from a Fairey III.F of No. 47 (Bomber) Squadron, R.A.F., at Khartum, on Apr. 13, after flying from Malakal. In the pilot's cockpit is Flt. Lt. Bowen-Buscarlet, and standing on the ground is His Excellency Sir John Maffey, Governor-General of the Sudan.—*(Photograph by G. Karakashian, Khartum.)*

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Commission of jurists at the Hague in 1923, especially in regard to prohibition against inflicting injuries to non-combatants and civilian property. Mr. Montague said that it had not been found possible to obtain the agreement of all the Powers concerned in the draft rules and no steps had consequently been taken to ratify them.

Air Co-operation in Peshawar.

The Times correspondent in Lahore in a message dated May 5 states that infantry, cavalry and aeroplanes took part in a raid in the early hours of Sunday morning with the object of clearing Peshawar. At daybreak the troops had the city under control.

Peshawar is the Headquarters of No. 1 (Indian) Group, R.A.F., and also the Station of No. 20 (Army Co-operation) Squadron.

Night Flying at Sea.

Exhaustive tests of night flying under Service conditions are being made by Royal Air Force Flying-Boat Squadrons stationed at Calshot and elsewhere on the South Coast. Comparatively little night-flying by flying-boats has been done since the end of the War 1914-18 and a great deal of experimental work will have to be done before any serious exercises can be performed.

At present, when weather conditions permit, night flying is being done three nights a week in the Solent and English Channel. The R.A.F. Units are co-operating with the Royal Navy and with the Mercantile Marine.

A Lifeboat Rescue.

The Air Ministry has sent its thanks to the Royal National Lifeboat Institution and to the coxswain and crew of the Bembridge (Isle of Wight) motor lifeboat for "the valuable services rendered to the Royal Air Force" when the Bembridge lifeboat went to the rescue of the Southampton flying-boat 1044 on Mar. 14. The Flying-boat, with a crew of six on board, came down on the sea one and a-half miles from Bembridge with a broken airscrew, and a consequently disabled engine.

Trooping by Air to Cyprus?

A message from Nicosia (Cyprus) dated Apr. 20, appeared in *The Manchester Guardian* of Apr. 21 and states:—

> One of the two Royal Air Force biplane troop-carriers, which took off from Cyprus to-day to return to the base at Cairo, developed propeller trouble and made a forced landing near Aylos Theodoros, on the hilly Karpas Peninsula, in the north-east of the island.
>
> The biplane was totally wrecked, but the seven occupants escaped without injury.

The Air Ministry state that they have no knowledge of the incident nor of any R.A.F. operations in Cyprus.

The assumption is, therefore, that the machines referred to were two Vickers Victoria troop-carriers of No. 216 (Bomber) Squadron, R.A.F., stationed at Heliopolis.

The British Forces in Cyprus consist of one Company of the 1st Battalion, The King's Regiment. The King's Regiment is stationed in Egypt and a Company is detached for Service in Cyprus every year. The Vickers Victoria has accommodation for twenty-two men in addition to its crew. Therefore two Vickers Victorias could transport the Cyprus Company from Heliopolis to Cyprus, about 410 miles, in three trips, bringing the relieved Company back on the return trips.

There are no real aerodromes, either Service or Civil, in Cyprus, but the country between Nicosia and the West Coast is all level and although partly under cultivation, part of it would make suitable landing grounds.

A Curious Accident at Shaibah.

A United Press message from Basrah published in *The Daily News* of May 5 states:—

> The remarkable escape from death of the famous long-distance flier, Flight-Lieut. L. E. M. Gillman, and an R.A.F. non-commissioned officer named Brookes while flying in 'Iraq has been revealed at a court of inquiry at Saidah Aerodrome.
>
> When in a formation flight their machine had a slight wing collision with another, and Flight-Lieut. Gillman was thrown out. He hit the tailplane of his machine, but managed to open his parachute and float to earth unhurt from 6,000 feet.
>
> Meanwhile Brookes found that his parachute had been rendered useless in the collision. He had never piloted a plane before, but he climbed into the pilot's seat and successfully landed the machine. It struck the earth heavily, but Brookes only suffered slight facial injuries.

The Saidah Aerodrome is obviously the Shaibah Aerodrome, the Station of No. 84 (Bomber) Squadron, R.A.F. The standard R.A.F. parachute is the Irvin, so Flt. Lt. Gillman becomes *ipso facto* a member of the Caterpillar Club.

A somewhat similar incident happened in the same Squadron about 1920 or 1921. The Squadron, which was at that time equipped with D.H.9as, was in action against some tribesmen in the Southern desert when the pilot of one of the machines was wounded and rendered unconscious. The gunner, a Leading Aircraftman, who was not a pilot himself, brought the machine some distance to its home aerodrome and landed it safely, thus saving his own life and that of the pilot. He was awarded the Air Force Cross.

More Service Caterpillars.

A Service aeroplane of No. 54 (Fighter) Squadron, R.A.F., crashed at Hornchurch aerodrome, Essex, on Apr. 29. The pilot, Flg. Off. T. B. Byrne, left the machine by parachute and alighted safely.

A Service aeroplane of No. 2 Flying Training School, Digby, crashed at Digby Aerodrome, Lincolnshire, on May 1. The pilot, Plt. Off. N. S. Lesmere, left the machine by parachute and alighted safely.

Compass Deviation Cards.

A new pattern Compass Deviation Card—Form 316A—has been produced for use with observers' compasses. The card is arranged to facilitate the reading of deviation on any course without interpolation and provides for the deduction of compass course from magnetic course or vice versa with the minimum difficulty.

The card is intended for use only in those units whose aircraft are fitted with observers' type compasses and in flying training establishments for instructional purposes. An initial issue is being made to those units, and subsequent requirements should be demanded in the ordinary way.

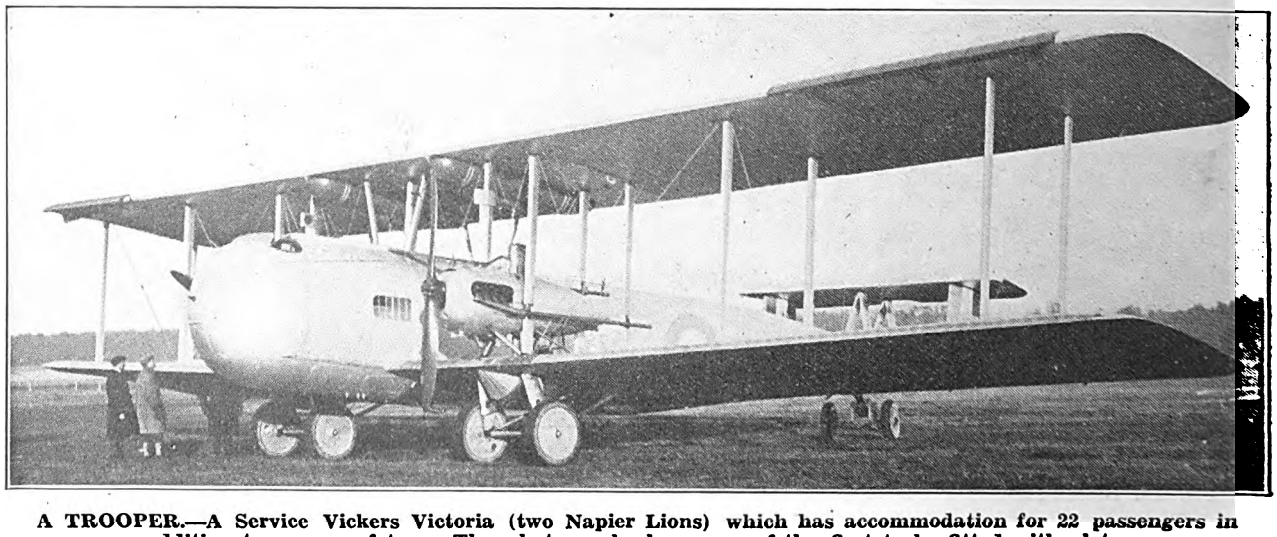
Sir Philip Sassoon.

Sq. Ldr. the Rt. Hon. Sir Philip Sassoon, G.B.E., C.M.G., M.P., Officer Commanding No. 601 (County of London) (Bomber) Squadron, Auxiliary Air Force, who, since his appointment to the command of this squadron has been undergoing flying training, has now qualified as a Service pilot and is entitled to wear the R.A.F. wings on his uniform.

Sq. Ldr. Sir Philip Sassoon was Under-Secretary of State for Air in the recent Conservative Government.

The R.A.F. Dinner Club.

The Eighth Annual Dinner of the R.A.F. Dinner Club will be held at the Connaught Rooms on June 27 (the eve of the R.A.F. Display) at 20.00 hours. Membership of the R.A.F. Dinner Club is open to all serving officers of the R.A.F. and past officers of the R.N.A.S., R.F.C., and R.A.F.



A TROOPER.—A Service Vickers Victoria (two Napier Lions) which has accommodation for 22 passengers in addition to a crew of two. The photograph shows one of the first to be fitted with slots.

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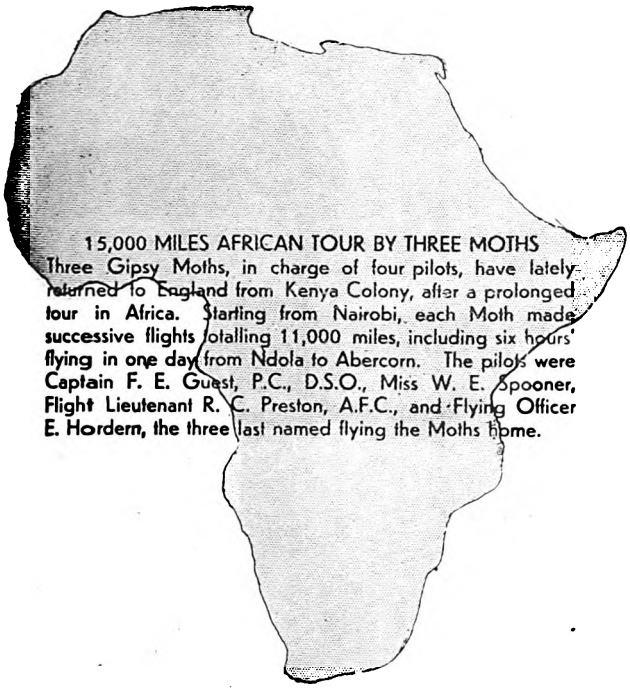
Recent Tours *by* Gipsy Moth

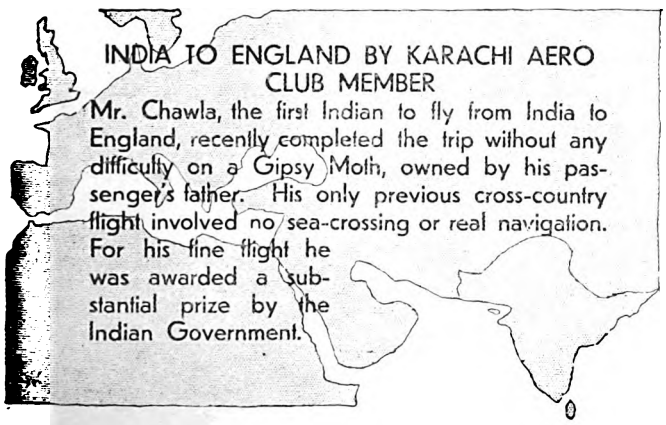


15,000 MILES AFRICAN TOUR BY THREE MOTHS

Three Gipsy Moths, in charge of four pilots, have lately returned to England from Kenya Colony, after a prolonged tour in Africa. Starting from Nairobi, each Moth made successive flights totalling 11,000 miles, including six hours' flying in one day from Ndola to Abercorn. The pilots were Captain F. E. Guest, P.C., D.S.O., Miss W. E. Spooner, Flight Lieutenant R. C. Preston, A.F.C., and Flying Officer E. Hordern, the three last named flying the Moths home.

CAPTAIN GUEST WRITES:

"The machines flew in all 200 hours each and were all top overhauled at 120 hours, no replacements of any kind being found necessary. On the return journey no mechanic was carried and no need was found for his services. The three Moths, which, of course, had wooden fuselages, were exposed to extremes of temperature and all kinds of weather conditions. The machines are still flying, no complete overhaul having been carried out, and this will not be effected until the actual time falls due. The whole tour went according to schedule, no alteration of plans being necessary. Each machine carried a certain complement of spares, but none of these was used. The machines were, as a rule, loaded up to the maximum weight of 1,750 lb., and were operating from aerodromes in all cases not lower than 4,000 feet, that at Nairobi being 5,600 feet."



INDIA TO ENGLAND BY KARACHI AERO CLUB MEMBER

Mr. Chawla, the first Indian to fly from India to England, recently completed the trip without any difficulty on a Gipsy Moth, owned by his passenger's father. His only previous cross-country flight involved no sea-crossing or real navigation. For his fine flight he was awarded a substantial prize by the Indian Government.

In an interview, Mr. Chawla said: "I have nothing but praise for the Moth and its Gipsy engine, both of which functioned perfectly throughout the flight, causing me no anxiety whatever."

Price from £595

THE DE HAVILLAND AIRCRAFT CO., LTD.

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SHEER RELIABILITY IN EVERY INSTANCE

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PER ARDUA SURGO (the motto of No. 45 (B) Sqdn.).—A Fairey III.F of No. 45 (Bomber) Squadron, R.A.F., flying above the Nile near Wadi Halfa. This Squadron is stationed at Helwan, Egypt.

Forms of application for membership can be had from the Honorary Secretary, Sq. Ldr. J. O. Andrews, Air Staff, Air Ministry, Kingsway, W.C.2.

Hockey.

The final of the R.A.F. Senior Hockey Cup competition was played at Uxbridge on Apr. 30. Henlow won the Cup for the fourth year in succession by beating Andover by three goals to nil. *The Times* account of the game says:—

The first half of the game was fairly level, both sides losing several chances. Stevenson, on the Henlow left wing, made several good runs and centres, but the Andover defence was sound, and the sides crossed over without scoring. After the interval Henlow distributed the ball better and played a more open game. Wolfenden, on the right, who had been starved in the first half, made some good runs and centres, and after 10 minutes' play, Craig picked up a pass outside the circle and, although colliding with the goalkeeper, managed to get the ball in the net. A second goal followed shortly afterwards, Stafford scoring with a good shot from a penalty corner. Andover played up hard, but could make no impression on the Henlow defence, and shortly before the finish Craig dribbled through to score the third and last goal.

The Henlow team were:—

AC. McKenzie, goal; Cpl. Beeton and Flt. Lt. Stafford, backs; L-AC. Harvey, L-AC. Carter, and L-AC. Hiscock, half-backs; L-AC. Stevenson, L-AC Craig, L-AC. Williams, L-AC. Royce, and F-S. Wolfenden, forwards.

Golf.

The three days' Spring Meeting of the R.A.F. Officers' Golfing Association was held at Walton Heath on Apr. 23, 24 and 25.

The serving officers' championship was won by Flt. Lt. E. S. Finch, who beat Sq. Ldr. A. E. Barr-Sim in the final.

The results of the competitions were:—

Qualifying Round for Championship.—Sq. Ldr. Barr-Sim, 158; Flt. Lt. Finch, 166; Flt. Lt. Macpherson, 172; Flt. Lt. Davidson, 177; Flt. Lt. Jackman, 178; Flg. Off. Nicholson, 180; Flt. Lt. Silvester, 182; Flt. Lt. Bett, 183.

First Round.—Finch beat Silvester by 4 and 3; Jackman beat Davidson by 6 and 4; Bett beat Nicholson by 8 and 7; Barr-Sim beat Macpherson by 7 and 6. *Second Round.*—Finch beat Jackman by 2 and 1; Barr-Sim beat Bett by 2 and 1. *Final.*—Finch beat Barr-Sim by 3 and 2.

36 *Holes Scratch.*—Sq. Ldr. Barr-Sim, 79+79=158.

18 *Holes Scratch.*—Flt. Lt. Finch, 79, after a tie with Barr-Sim.

Team Competition.—Farnborough 503.

36 *Holes Handicap.*—(First Division): Flt. Lt. Jackman (10), 158 net; (Second Division): Flt. Lt. Cockey (16), 161 net.

18 *Holes Handicap.*—(First Division): Flt. Lt. Macpherson, 82 — 3= 79. (Second Division): Flt. Lt. Clarke, 93 — 12=81, and Flt. Lt. Bruce, 95 — 14=81, tied.

Best Nine Holes.—(First Division): Flg. Off. Nicholson, 37. (Second Division): Flt. Lt. Booth, 36.

Bogey.—(First Division): Flt. Lt. Jackman, 4 up. (Second Division): Flt. Lt. Clarke, 3 up. *Bogey Foursomes.*—Flt. Lt. Yool and Flg. Off. Nicholson, 5 up; Flt. Lt. Weare and Flt. Lt. Barnes, 4 up.

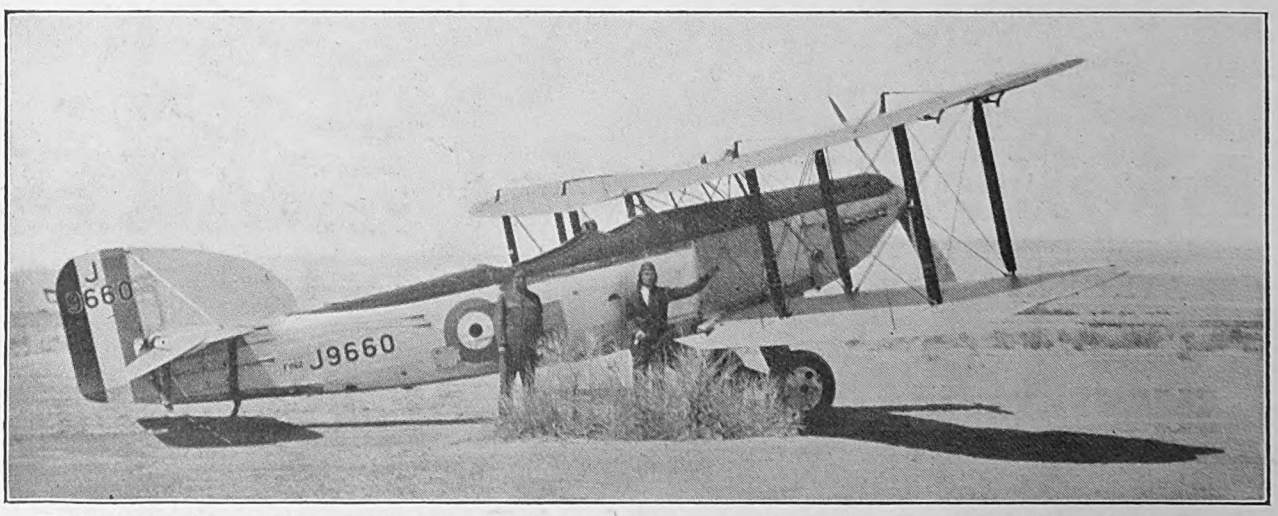
Second 18 Holes Scratch.—Flt. Lt. Gough, 79.

Handicap.—(First Division): Flt. Lt. Clarke, 86 — 10=76, after a tie with Group Capt. Briggs, 81 — 5=76. (Second Division): Flt. Lt. Yool, 85 — 11=74, after a tie with Air Cmdre. Freeman, 92 — 18=74.

Nine Holes.—(First Division): Flt. Lt. Davidson, 37. (Second Division): Sq. Ldr. Sugden, 37.

THE ROYAL ACADEMY BANQUET.

Replying to the toast of "The Armed Forces of the Crown" at the Royal Academy Banquet on May 3, the Lord Thomson, Secretary of State for Air, said that there had recently been a controversy in the Press, overflowing into the House of Lords, which had manifested a certain feeling between the three Services. In his view there was no need for anxiety in regard to that controversy, which he considered was more a sign of emulation than of jealousy. Some of the brightest brains in Whitehall had been sharpening their wits upon each other for many years on this topic.



THE DEAD SEA.—A Fairey III.F of No. 14 (Bomber) Squadron on the landing ground at El Lisan, in the Dead Sea, which is 1,000 ft. below sea level.

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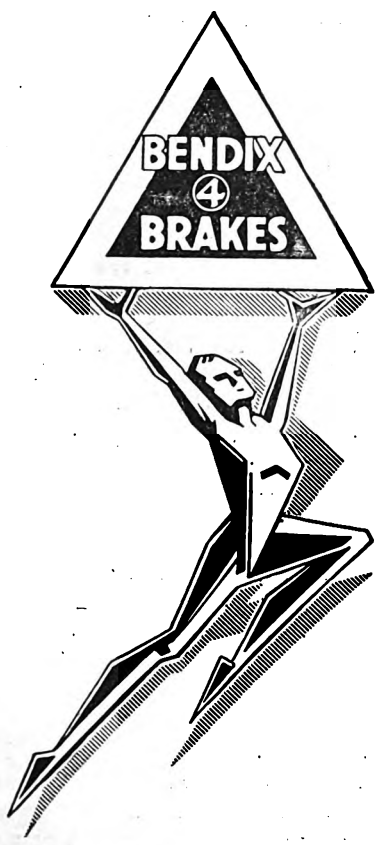
INVALUABLE ON RECORD FLIGHT

INFORM BENDIX THEIR BRAKES INVALUABLE ON FLIGHT THEY ARE REALLY SPLENDID = BARNARD

So cabled Captain Barnard who piloted the Duchess of Bedford's "Spider" Monoplane in her World Record Flight to the Cape.

Bendix "Servo" Brakes proved invaluable because among other advantages they ensure perfect Ground Control, enabling safe landings to be made in small areas and permitting cross-wind taxi-ing and take-off—thereby avoiding the danger of disastrous ground loops.

Bendix Brakes are the most modern development in Airplane control, and no Pilot need be without them if he specifies them when ordering his machine.



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Unlike so many so-called Sports Cars the 18/80 M.G. Six Sports Mark I. backs up its sporting coachwork with a genuine sporting performance.

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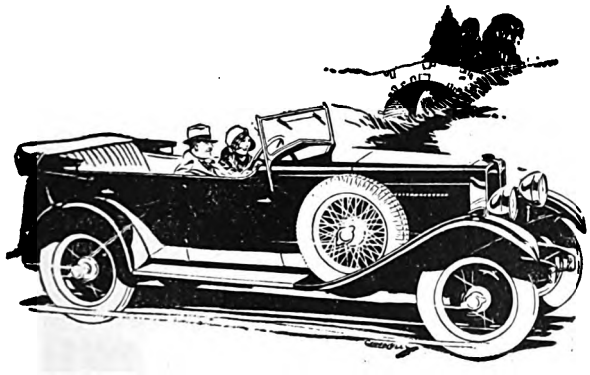

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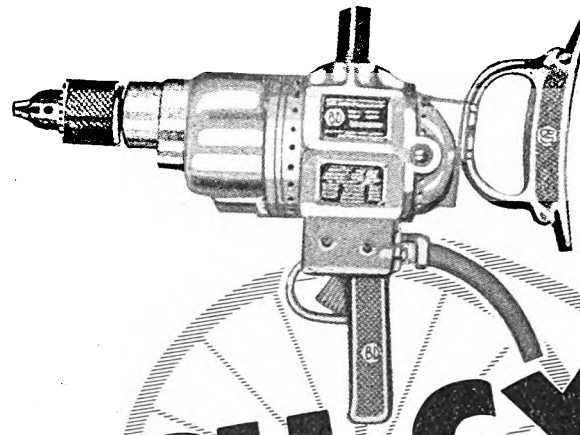

"HIGH CYCLE" SUPER-POWER ELECTRIC TOOLS for — heavy duty production

The complete range of Black & Decker Portable High Cycle Tools is fully described in the new High Cycle brochure shown above. Write for it.

IF you are using ten or more portable Electric or Pneumatic Tools it will pay you to put in a Black & Decker *HIGH CYCLE* Installation . . . simplifying the work . . . increasing production . . . reducing costs! High Cycle is the latest and most efficient development in Heavy Duty Production, the Black & Decker Tools being driven by a squirrel-cage type motor operating on 200 cycle current giving the following BIG advantages :—

Greater power per pound.
No revolving wires — rotor being made of solid copper bars, rivetted and welded in position.
Maintained speed under load, increasing productive capacity.
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Mechanical and electrical design built for heavy duty and continuous production.
Obtainable from the leading Machinery and Electrical Accessory Dealers.

BLACK & DECKER

SUPER POWER *High Cycle* PRODUCTION TOOLS

BLACK & DECKER LTD., SLOUGH, BUCKS.—*Also at Toronto, Ontario, CANADA, & Sydney, N.S.W., AUSTRALIA.*

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

SHOREHAM VAPOURINGS.

A channel fog drifted into the South Downs on Sunday, May 4. Motoring to the flying meet at Shoreham Aerodrome about noon one discovered one John Rogers and his little blue Klemm monoplane in an absurdly small field about four miles north of the aerodrome. He was gazing into the mist with a monocled and malevolent eye and stated that he was definitely not going into the soup again and it must lift before the Air Display was favoured with his presence.

A white Moth, G-AAUS, came over, disappeared into the cloud, re-emerged, and after one look at Mr. Rogers' field went and landed somewhere else. A Desoutter, G-AATK, was last seen diving into the hills to the East.

At Shoreham Aerodrome visibility was only slightly better and Wing-Commander George Pretyman wisely announced that the start of the programme would be delayed. Four of the visitors offered to "formate" by way of a stop-gap. Mr. R. Bentley in the Hermes-Moth G-AAIM, Mr. A. C. M. Jackaman in his Gipsy-Moth Coupé, G-AADX, Flt.-Lt. T. Rose in his Moth, G-AAKJ, and Mr. S. Thorn in the Hermes-Avian, G-AAHJ, flew in close formation through gaps in fog and were duly appreciated by the crowd, which was already large. Mr. H. H. Leech took up the Genet-Martlet and showed its paces, which are exceedingly fast and handy, in a variety of aerobatics.

A slight lifting of the fog induced the Master of Ceremonies to start the parade of aircraft, in which the machines already mentioned took part, with Mr. Bellairs flying the Martlet, and also Mr. Rogers, who had just arrived in the Klemm D 1776.

The parade derived most of its thrill from the antics of Mr. Bentley's Hermes-Moth, which crazy-flew over the surrounding country in a manner which said volumes for the pilot's faith in his engine and rather demanded an equal confidence among the spectators. Because of the very poor visibility and the occasional arrival of visiting aircraft there was still considerable danger in the parade at that time, which the cavortings of the golden Moth did nothing to reduce. Fortunately no really narrow shaves occurred to disquiet the spectators, although the Martlet once looped up into the low cloud and the Klemm, which was following, turned sharp right to be out of the way of the subsequent dive.

Flt. Lt. Rose, of the Anglo-American Oil Co. Ltd., and Mr. Thorn of the Cirrus firm gave excellent individual displays of aerobatics and Mr. John Tranum walked the wings of an Avro piloted by Mr. Miles.

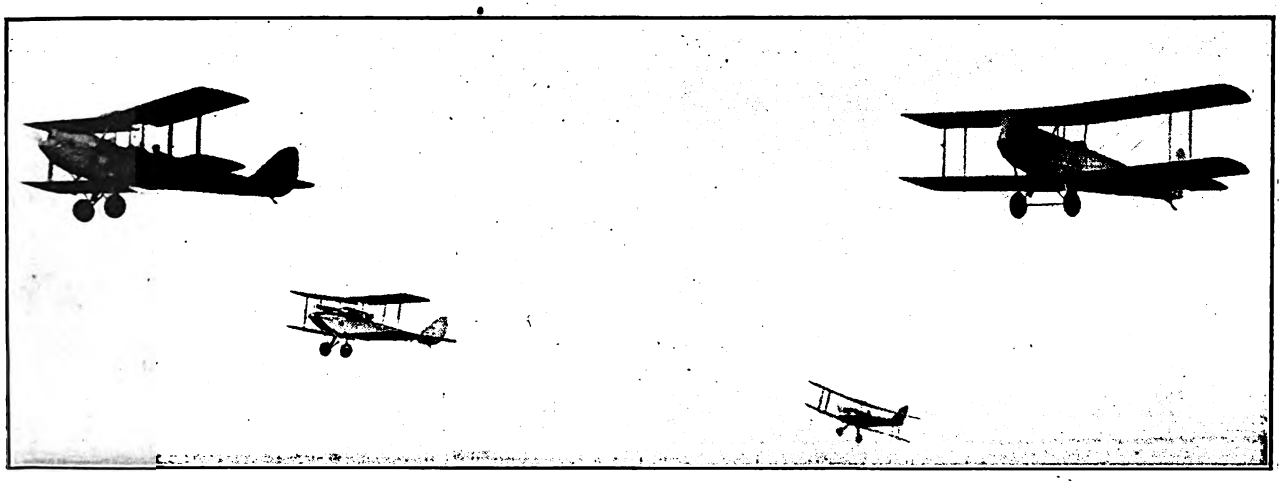
Among the visitors present were Sir Sefton Brancker, Director of Civil Aviation, who motored down; Lt.-Col. Henderson, in the Desoutter previously mentioned as disappearing in the Sussex Downs, among which he had rested for lunch; Mr. R. Wyndham in G-AAUS, ditto; Mr. B. Thynne in a slotted Spartan, G-AAGY; Miss Brown in a Cirrus-Avian, G-EBVZ; W. G. Robson in a Gipsy-Moth, G-AADV; Mr. Stack in his Hermes-Moth, G-EBUF, which is looking extremely smart in new cream and scarlet; and Mr. Handstock in "Miss Ethyl," the slotted Widgeon, G-AAFD, in which Mr. John Tranum came as a passenger.

Unfortunately Mr. Tranum's usual parachute descent had to be cancelled owing to a damaged parachute. Mr. Stack at the request of the management entertained the assembly with his usual effective stunting immediately after his arrival.

SUMMER KIT.—The Automobile Association's ever-present helpers in time of trouble.

This. Wing-Commander Pretyman's first essay at an air show, was dogged by bad luck. The impossibility of running through the programme while fog rolled over the ground kept the crowd waiting for unavoidable intervals in spite of gallant efforts by visiting pilots. Furthermore, the illicit penetration by devious routes of numerous non-contributing hedge-guests hindered progress by thronging the machine-park as well as the more exclusive enclosures.

The loud-speakers, which are a useful adjunct to these functions, do not function very well when the aerodrome is so small as that at Shoreham, owing to the constant close-ups of engine noises, and the announcer did not seem to be well supplied with information. There ought at least to be a register of visiting pilots and all participants in which they should be asked to enter the type, engine and marking of their aeroplanes. This would enable the announcer—and the Press—to report proceedings without those lapses from accuracy which those in charge of flying meetings are most interested in avoiding, and most prone to resent afterwards.—F. D. B.



THE FOG OF PEACE.—The performers at Shoreham,—Mr. Bentley, Mr. Jackaman and Flt. Lt. Rose in Moths and Mr. Thorn in an Avian.

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The most northerly air-route in America!

Covers 1800 miles from Fort McMurray, Alberta, to Aklavik on the Arctic Ocean. Operated by Commercial Airways Limited of Edmonton, Alberta, using Six-seater Bellanca Monoplanes fitted with 300 h.p. Wright Whirlwind engines lubricated with CASTROL. The report of Canadian Wright Ltd. on one of the engines is reproduced below:—

CANADIAN WRIGHT Limited, MONTREAL.

Messrs. C. C. Wakefield & Co., Ltd.,
New Birks Buildings,
Montreal.

February, 10th, 1930.

Attention Mr. H. H. Ferguson.

Gentlemen:

We beg to acknowledge receipt of your letter of the 5th inst., relating to the J-6 engine which has been overhauled by us for Commercial Airways, Edmonton.

It was understood from our serviceman, Mr. Sims, that this engine has used CASTROL. This engine has been stripped down and is in a remarkably good condition and the amount of replacement parts is negligible. This engine has done nearly 200 hours, having done a trip from Edmonton to Aklavik under the most trying conditions. At times the temperature was as low as **60° below zero.** The cylinder walls and the pistons are in extremely good condition and there is **a very small amount of carbon** on the pistons.

This engine **could easily have done double** the amount of time without having to be stripped down and it is extremely gratifying to see the **excellent results** from a good quality of lubricating oil, and we have no hesitation in **recommending the use of this oil** on Wright Whirlwind engines. The use of **this oil certainly reduced operation costs.**

Yours faithfully,
CANADIAN WRIGHT LIMITED,
ARTHUR S. SUDDES,
Service & Works Manager.

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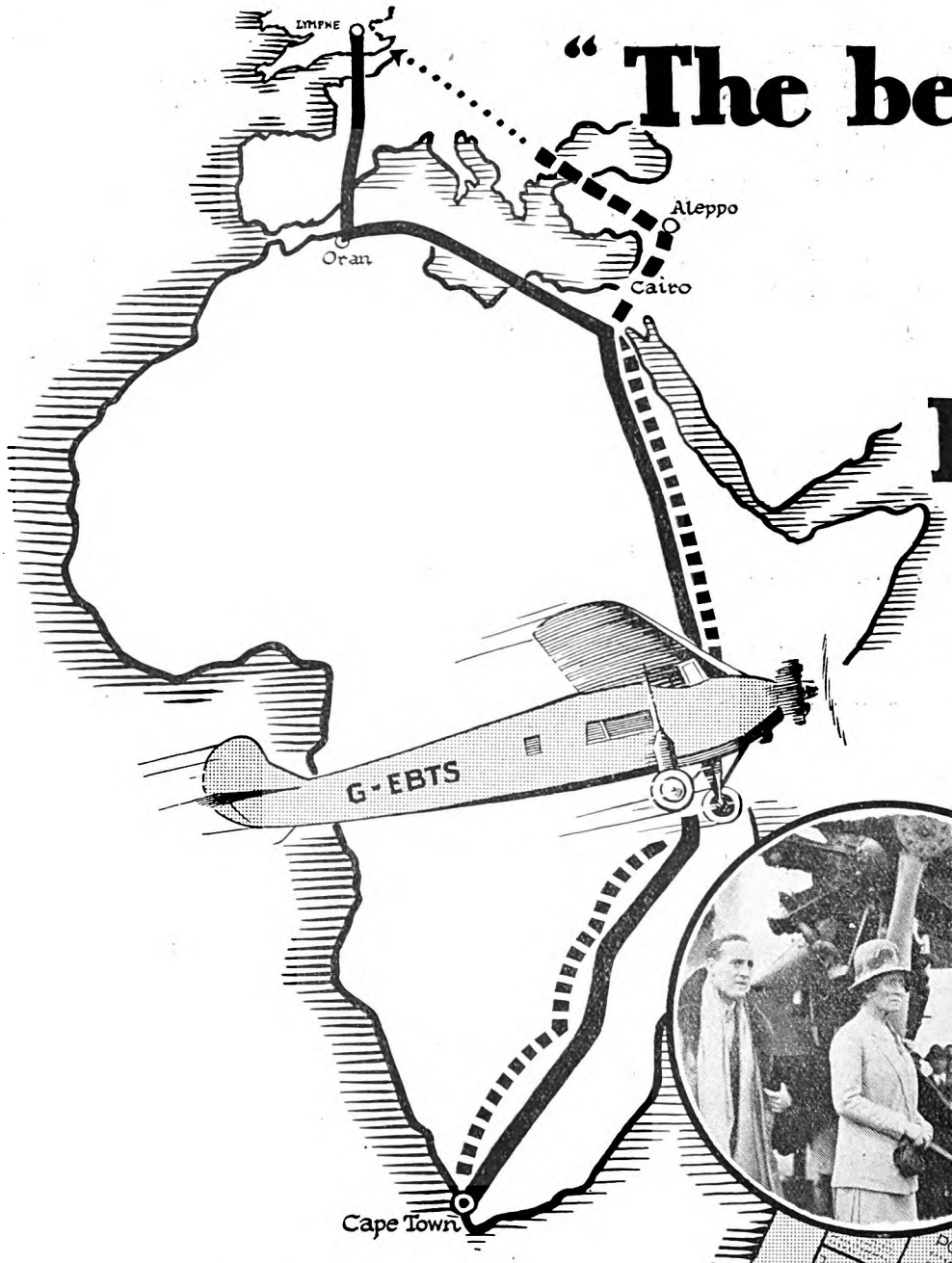

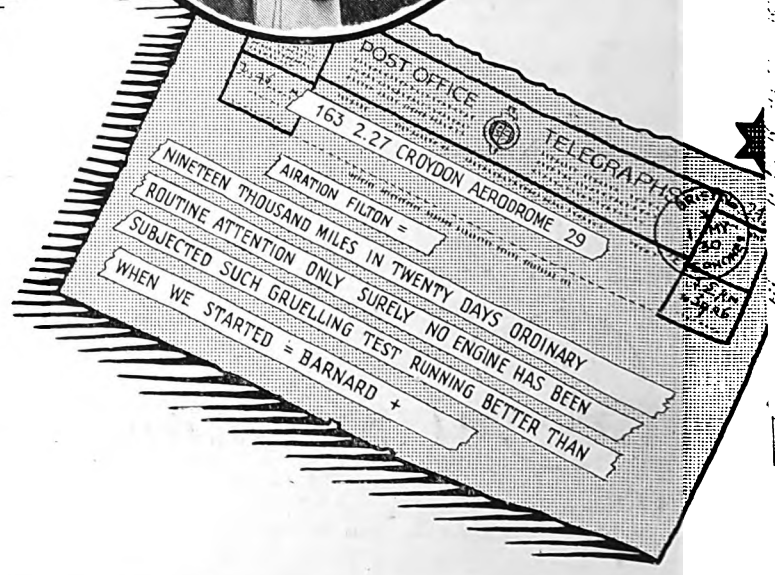

EIGHT NEW RECORDS.

April 10—First non-stop flight England to Africa.

April 19—First non-stop flight Bulawayo to Capetown.

April 19—Longest non-stop flight in Africa.

April 19—Completion of England to Capetown flight in 10 days.

April 26—First non-stop flight Khartoum to Cairo.

April 26—Completion of Cape to Cairo flight in 6 days.

April 30—Completion of Capetown to London flight in 10 days.

April 30—Completion of England to Capetown and back flight in 20 days.

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civil aviation for three or four years!"

vide **Air Vice-Marshall Sir Sefton Brancker**, *Director of Civil Aviation.*

Her Grace the Duchess of Bedford with Capt. C. D. Barnard and Mr. R. Little as pilots have completed a record flight from

Cape Town and back, miles in 20 days!

with a

"Bristol" Jupiter engine

The Aircraft used was the "Spider" Fokker Monoplane and the Engine of the "Bristol" Jupiter Series XI.F. Type.

Speaking of the performance of the Bristol Engine in this memorable and epoch making flight Capt. Barnard pays the following tribute:

"Then there was the splendid behaviour of the engine which stood up so successfully to 200 flying hours. It should be a matter of pride that British workmanship has rendered this possible, although perhaps only those familiar with aero engines will realise what a magnificent performance our 'Bristol' Jupiter has put up."

Capt. C. D. Barnard in the "Daily Express" May 1, 1930.

THE PREVIOUS RECORD FOR THIS FLIGHT WAS 101 DAYS.

The "Bristol" Jupiter Engine is Designed and Manufactured by

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FLY AS YOU DRIVE SIDE BY SIDE

"Come to think of it, Paddy, this side by side seating is only sensible."

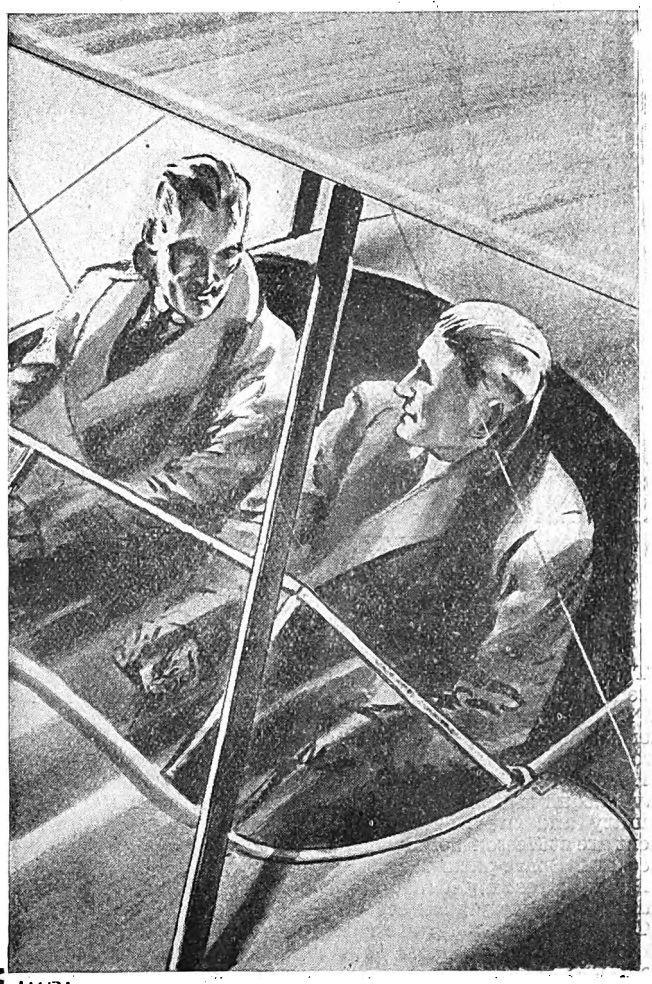
"Of course it is. But this Blackburn Bluebird's the only English plane that's got it."

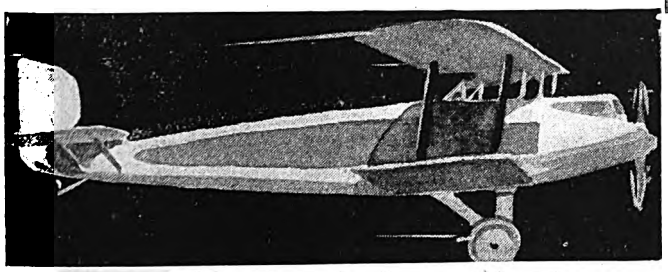
"Amazing."

"It always happens that way. For years and years we put up with something that's obviously wrong until someone has the sense to do the thing intelligently. In this case Blackburns."

"It's just like the car. Side by side, no telephones or any fuss of that sort, and every bit as comfortable too."

"Yes, and fast and reliable and easy to handle. She's a great little 'plane, the Blackburn Bluebird.'





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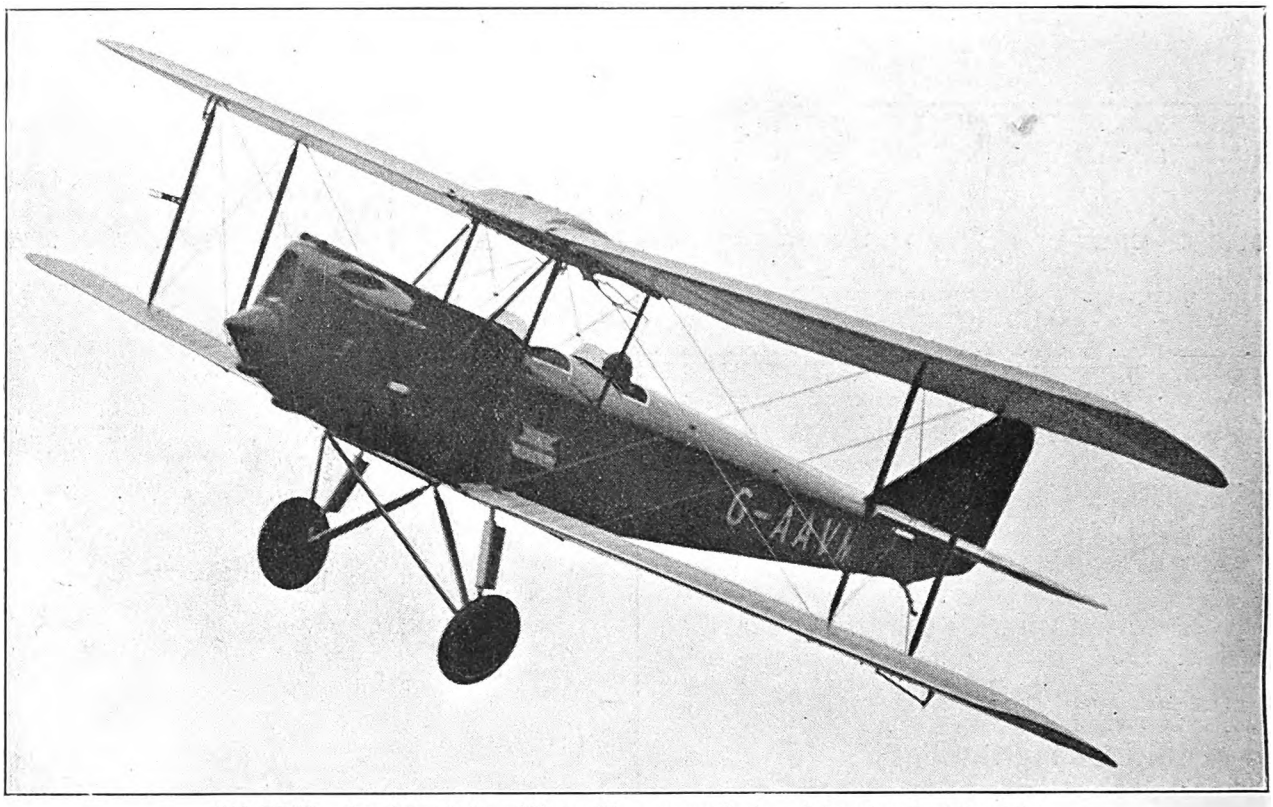

ON TEST.—An Avro Avian (Cirrus Hermes engine).—(*"Aeroplane" photograph.*)

FLYING TESTS OF MODERN LIGHT AIRCRAFT.

II—THE HERMES-AVIAN.

[By Christopher Clarkson.]

The Hermes-Avian is a two-seat light biplane with metal fuselage and wooden wings built by A. V. Roe and Co., Ltd., of Manchester. Its normal power plant, the 105/115 h.p. Hermes engine, is made by Cirrus Aero-Engines Ltd., of Croydon.

Henlys (1928) Ltd., the well-known automobile agents, have acquired the sole agency for this machine for this country and the Headquarters for their Aviation Department are at Heston aerodrome, where they have a Sales, Service and Spare-parts Depot.

During a test flight made by the writer at Heston the machine gave a very good account of itself.

Throughout its tests the machine showed itself to be one of the nicest of its class that the writer has flown, apart from two peculiarities which are present in 90 per cent. of modern light aeroplanes.

One is a certain heaviness of the lateral control at anything except low speeds. One may be fussy—or the average owner may not be so particular—but it is essential to have the controls not only well-balanced in their relation to one another and efficient in action, but also light to handle as well? Heavy steering damns a car and heavy controls may damn a light aeroplane, ven if only one of them is at fault.

The Hermes-Avian is not so heavy as some other machines, admittedly, but it seems a pity that a machine which is so good should have any peculiarity which is easy to remedy.

The other point is that of view—also a very common fault. The back seat is rather far forward under the planes, which obstruct the view upwards and outwards. The front seat is better in this respect, because of the rather large gap.

The day is past when one can go from London to Leuchars and never meet another machine, and there are far too many aeroplanes flying round our aerodromes to make a "blind" machine anything but a menace to all concerned. This question of view does not get enough attention paid to it in civilian aircraft.

In all other respects the machine is excellent. The climb is 5,000 feet in 5½ minutes and the air-speed indicator showed a top speed of 108 at ground level, and a cruising speed of 94 at 1,880 r.p.m.

The take-off is quick, and there is plenty of control for cross-wind take-offs and landings.

The glide is particularly pleasant. It is slow and rather flat, but with ample control, and one feels all the time that the machine will do exactly what is wanted of it.

The machine side-slips well, and recovers without any sinking. The actual landing is made at a slow speed, with a correspondingly short run.

It has a tail incidence actuating gear by means of a wheel on the left-hand side of the cockpit, which is a great advantage, and a fitting which would improve other light aeroplanes.

The controls are efficient at all speeds, but might be more closely balanced in their relation to one another. The fore-and-aft control is light, the directional control is normal and the lateral control is rather heavy—as already mentioned.

The stall in level flight is gentle, and the recovery is quick and easy. When stalled on a turn there is no tendecy towards a spin. The machine sinks away without attempting to whip into a spin, and control is recovered almost immediately. It is in fact a difficult machine to spin, and has to be forced in with the incidence wheel wound well back. Once in it has to be held in and it comes out rapidly without undue loss of height.

For such aerobatics as could be made without shoulder straps the machine was good. It was very manœuvrable and answered quickly to the controls.

A point about this machine is, that whatever one is doing, one feels that one has complete control of it, and there is never the feeling that is sometimes found that the machine is really flying you.

The cockpit is comfortable, but would be improved by an adjustable seat. The vibration, or lack of vibration, is moderately good, and although the machine flown had no exhaust-pipe, and was consequently noisy, when the long exhaust-pipe is fitted the engine should be quiet enough.

The controls are well placed, with the exception of the incidence wheel which would be in a more convenient position if it were moved a few inches forward and it should also be duplicated in the front seat.

There is a full set of instruments, including a compass, but a turn indicator is not included.

The view, apart from details already mentioned, is satisfactory, and is especially good directly forward along the nose as the top of the fuselage and engine cowling are quite clear and free from bits and pieces. This improves the view when gliding in, and enables the pilot to see more of the area on which he is proposing to land.

The machine is easy enough to taxi, and the tail can be lifted round by hand. The tail-skid is non-steerable.

Spares and service, apart from that available at Heston, can be got both at Hamble and Manchester, and Henlys Ltd., are prepared to give all reasonable service to their customers.

The appearance and finish of the machine are quite up to the best British standard.

A large luggage-locker is provided behind the rear seat,

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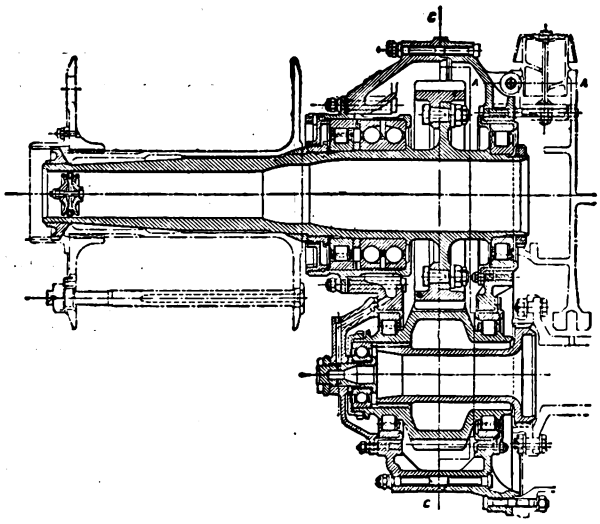

ADVANTAGES OF THE ROLLS-ROYCE 'F' AND 'H' ENGINES

(E)—Reduction Gear

In the Rolls-Royce design the small but inevitable deflections of the crankshaft are isolated from the crankshaft pinion, thus ensuring perfect alingment of the teeth of both gear wheels under all conditions.

ROLLS-ROYCE LIMITED, 14-15 CONDUIT ST. LONDON W.1

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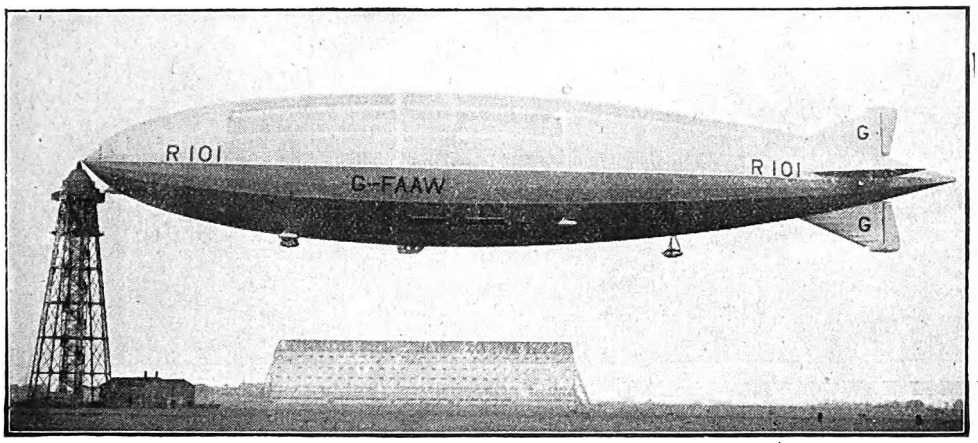
ALL-METAL AIRCRAFT



By courtesy of "Flight."

The Boulton & Paul System of Metal Construction

The structural design of H.M. Airship R.101 represents an entire departure from all hitherto accepted standards of airship production, and convincing proof of the soundness of the ship's many novel features has already been afforded by her preliminary tests.

The whole of the main framing of this ship was manufactured by Boulton & Paul Ltd., and the actual design of this framing embodies the results of their unrivalled knowledge of the technique of metal aircraft construction.

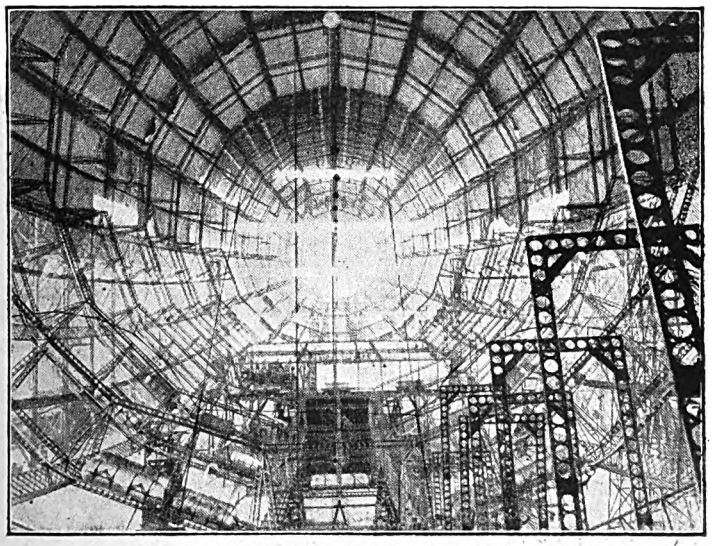
Those who contemplate embarking on all-metal aircraft design can obtain full particulars of the available sections and their characteristics upon application.

BOULTON & PAUL LTD., NORWICH

London Office - - - 139, Queen Victoria Street, E.C.4.

DESIGNERS & MAKERS OF ALL-METAL AEROPLANES & AIRSHIPS.

Contractors to the Air Ministry, the Admiralty, the War Office, H.M. Board of Works, the Crown Agents to the Colonies, English, South American and Indian Railways, Soudan, South African and Egyptian Governments.



Royal Air Force Official. Crown Copyright Reserved.

This photograph gives some idea of the complexity of R.101's structure, and of the adaptability of the Boulton & Paul methods of metal construction to all types of aircraft.

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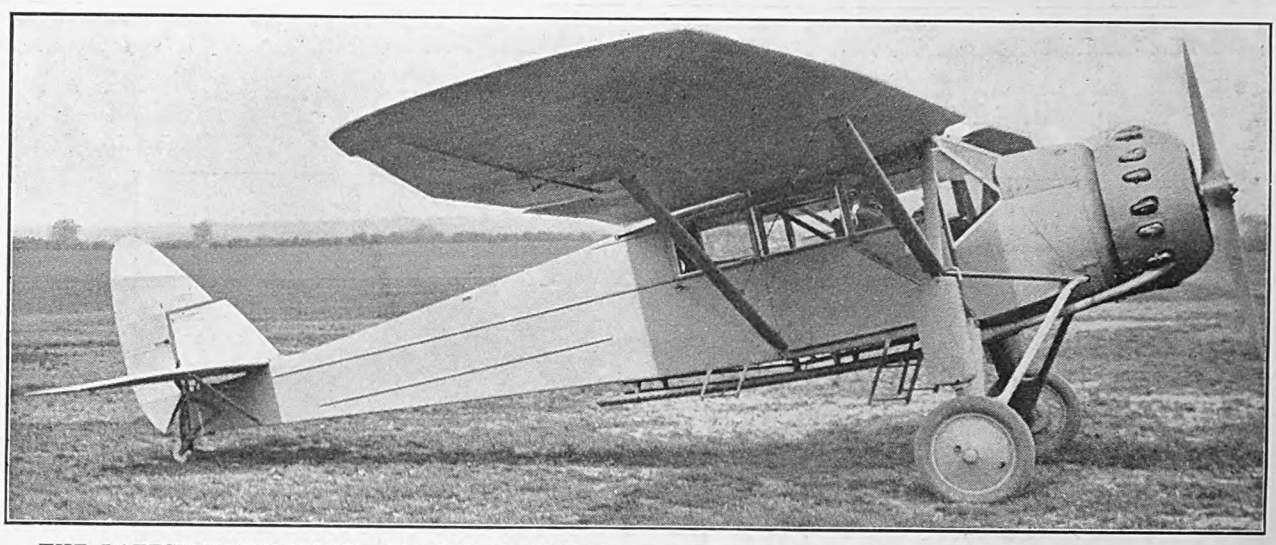

THE LATEST HAWK-MOTH.—The D.H. Hawk-Moth six-seat cabin monoplane with the 300 h.p Wright Whirlwind engine and special D.H. cowling.—(*"Aeroplane" photograph.*)

FEMININE ASPIRATIONS.

On May 5, at 07.45 hrs., Miss Amy Johnson left Croydon Aerodrome in an attempt to fly to Australia. Miss Johnson is the first woman to qualify as a ground engineer. She is flying a D.H. Gipsy-Moth, which she has named *Jason*. In this machine Mr. Hubert Broad in July 1928 put up an unofficial duration record of 24 hours, and in the same machine Mr. Lawrence Hope flew to Kenya and back on a special newspaper mission.

The fuel capacity of the machine was increased to 80 gallons for such performances. There is a 35-gall. tank in the front cockpit and a 25-gall. tank in the fuselage, as well as the standard gravity tank. This should give a duration of about 18 hours at cruising speed.

Miss Johnson apparently has no schedule, and her probable date of arrival, her route and stopping places all seem to be delightfully vague.

Miss Johnson arrived at Vienna in about 10 hours after leaving Croydon. This first long stage, which Miss Johnson seems to have flown non-stop, augurs well for the success of her venture.

GREAT CRISTOFERO!

A dispatch from Addis Ababa states that two distinct types of print have been used for overprinting the Abyssinian Air Mail stamps, one showing a colon after the last Arabic character at the base of the overprint, and one without the colon. The Abyssinian Postal authorities state that the stamps without the colon were issued accidentally, and they are therefore likely to be much scarcer than those with the colon. Philatelists will do well to note this detail, as it may mean a rise in value before long.—N. N. S.

MOTH—ER INDIA.

Three aspirants are on their way in attempts to win the Aga Khan's prize of £500 for the first Indian to fly solo from India to England or *vice versa*.

Jehangir R. D. Tata left Karachi at dawn on May 3 and flew to Jask, whence he started for Basrah on Sunday. He is a member of the Bombay Flying Club.

The other two contestants are travelling in the Eastward direction and are about neck and neck to date. Man Mohan Singh, who left England some months ago and crashed in France, got as far as Abukir on May 5, while Mr. Adley Irani, otherwise Mr. A. Engineer, left Benghazi the same day on his way to Tobruk.

All are flying Moths.

A FEMININE PERFORMANCE.

Mlle. Lena Bernstein, flying a Farman 190 monoplane (230 h.p. Salmson engine), has succeeded in emaining in the air for 35¾ hours. She thus beats the previous best time for duration for women, of 27 hrs. 17 mins., put up by Mme. Maryse Bastié.

Mlle. Bernstein also holds the women's record for the longest non-stop flight in a straight line with 1,687 miles.

AN INCLUSIVE SHOW.

Weybridge Automobiles Ltd., under the management of Mr. J. Allday, himself an ex-R.F.C. officer, have staged an attractive motor show, in which there is a speed-boat and, in order that earth, air and water may be adequately represented, a D.H. Cirrus Mark II Moth as well. This Moth is the property of Major Marmaduke Pickthorne, who will fly it personally in the forthcoming King's Cup race.

THE LATEST HAWK-MOTH.—A nose view of the 300 h.p. Wright Whirlwind engine in its special D.H. cowling on the D.H. Hawk-Moth cabin monoplane. —(*"Aeroplane" photograph.*)

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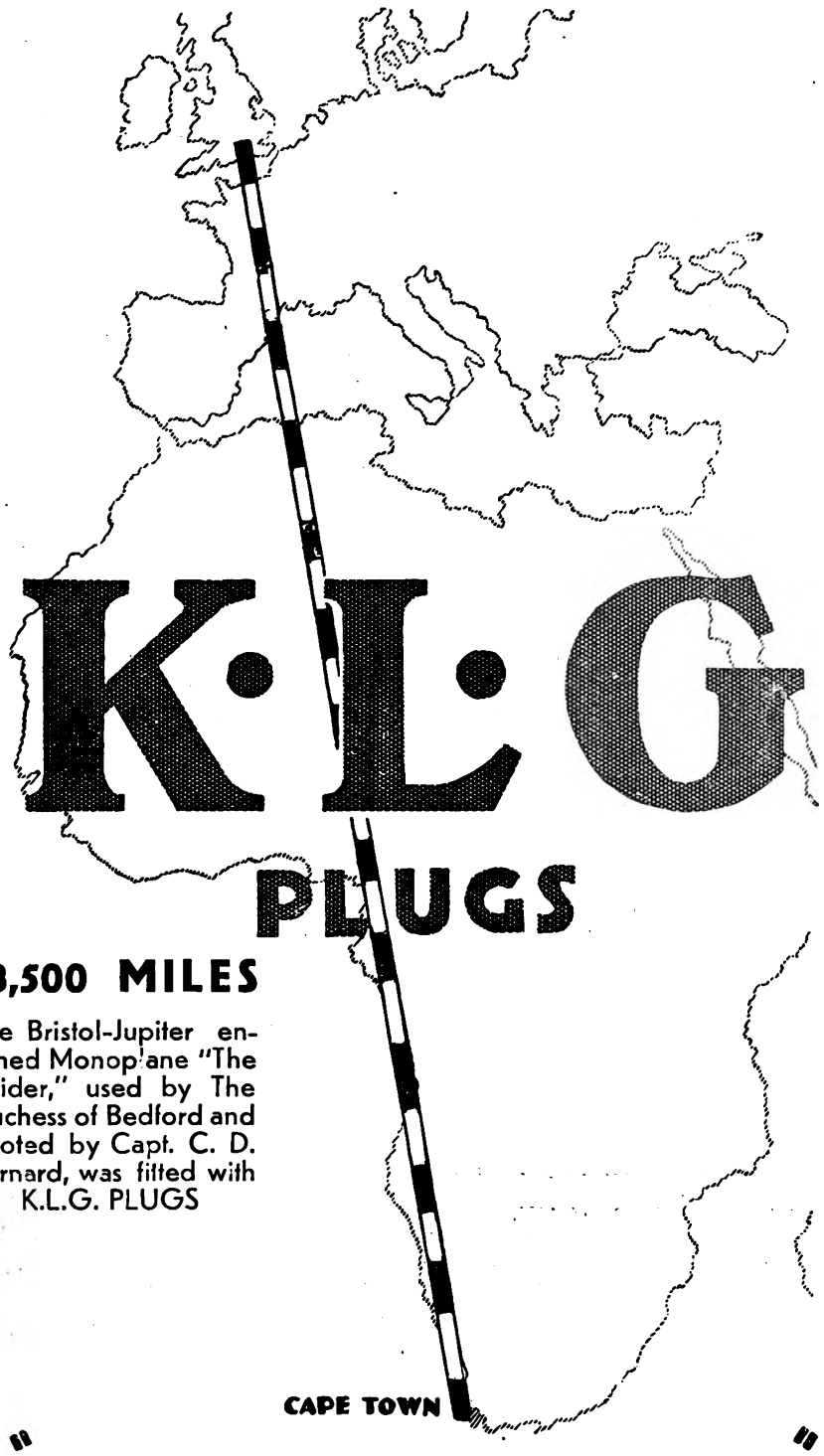

18,500 MILES

The Bristol-Jupiter engined Monoplane "The Spider," used by The Duchess of Bedford and piloted by Capt. C. D. Barnard, was fitted with K.L.G. PLUGS

"FIT AND FORGET"

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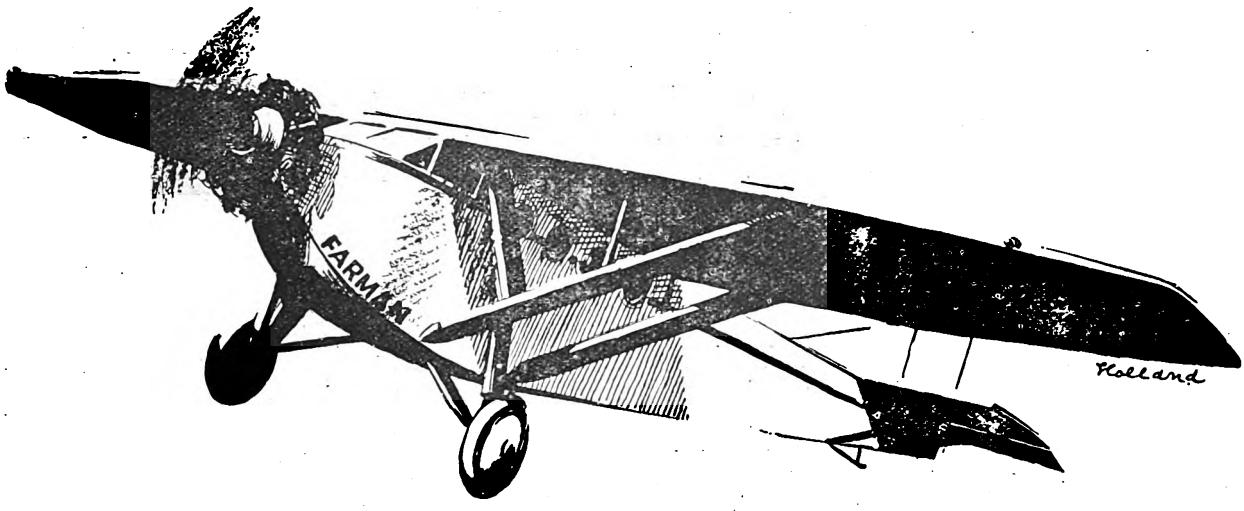

Women's World Flying Endurance Record ON SHELL

The world's endurance flying record for women pilots has been broken by

Mlle. Lena Bernstein

flying a Farman 190 machine fitted with a 230-h.p. Salmson engine.

Commencing on May 2 last she remained in the air for 35 hours, 46 minutes, 55 seconds, thus beating all previous records of this class for women pilots.

As in so many cases where reliability was of paramount importance

SHE CHOSE GOLDEN SHELL OIL and SHELL AVIATION SPIRIT

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THE R.Ae.C. TOURING DEPARTMENT.

With a view to assisting those who are interested in touring and travelling by air, both at home and abroad, the Royal Aero Club has formed a special department to deal with this branch of aviation. The Club supplies all information necessary or likely to be of use in any contemplated flight or tour.

Advice and information may be obtained about air routes with particulars of aerodromes, landing grounds, prohibited areas and air corridors; also about the official requirements and formalities to be conformed to on entering or leaving a country.

Large-scale maps showing all known aerodromes and landing grounds are available at the Club, and any particular maps required will be supplied or prepared.

The Royal Aero Club, as the sole authority recognised in this country by the *Fédération Aéronautique Internationale,* issues Customs Carnets, together with the necessary customs forms, and, where permits are a condition of entering a country, these are obtained.

The Carnet enables the holder to travel without having to make payments for Customs Dues on Aircraft when arriving in a foreign country. The charge for the Carnet to members of the Royal Aero Club and Associated Light Aeroplane Clubs is £1 5s. for aircraft not exceeding £1,000 in value, and £1 11s. 6d. for aircraft valued over £1,000. An additional £1 1s. is charged to non-members.

In making application for the Carnet the following particulars must be supplied:—(1) Name and address of pilot; (2) proposed date of departure from England; (3) type of aircraft; (4) monoplane or biplane; (5) registration mark; (6) value of aircraft; (7) weight empty; (8) span; (9) wing area; (10) wing construction (wood, fabric, metal); (11) colour of aircraft; (12) number of seats (including pilot's); (13) type of fuselage (open or closed); (14) engine: type, horse-power, manufacturer's number.

Application forms may be obtained from the Royal Aero Club, 3, Clifford Street, London, W.1.

MEMBERSHIP OF THE R.Ae.C

The following are the subscription rates to the Royal Aero Club:—

Ordinary Members, £6 6s.; Officers of the Royal Air Force, the Royal Air Force Reserve, and Air Ministry Departments, £3 3s.; Members of Associated Light Aeroplane Club (*i.e.,* Full Flying Members) holding current "A" or "B" Licences, £3 3s.

There is no Entrance Fee. Further particulars may be had from Mr. Harold E. Perrin (Secretary), 3, Clifford Street, London, W.1.

THE INTERNATIONAL TOURING COMPETITION.

Herr Gerhardt von Hoeppner, the General Secretary of the Aero Club of Germany, is making a tour by air of the course to be used in the International Touring Competition for Light Aeroplanes. On April 30 he reached England and visited the Municipal Airport at Bristol and the Heston Air-Park, London, and he was afterwards entertained to dinner at the Royal Aero Club.

Herr von Hoeppner took the opportunity of discussing the general arrangements of the Competition with Major C. J. W. Darwin and H. E. Perrin, representing the Racing Committee of the Royal Aero Club.

Hereafter appear the entries for the *Challenge Internationale de Tourisme,* which will start from Berlin on July 20. The entries are grouped under the Clubs under whose ægis they will fly. The first name given is that of the individual entrant. Then comes the make and type of aeroplane. Then comes the make and type of motor. And, when nominated, the name of the pilot appears in brackets:—

GERMAN AERO CLUB.

Verein Für Luftahrt—B.F.W. M.23b—72/89 h.p. Siemens S.H.13—(——).

Leichtflugzeugbau Klemm G.m.b.H.—Klemm L.26V—80/100 h.p. Argus As.8—(Spengler).

Ditto—Klemm L.25E—80/100 h.p. Argus As.8—(Lusser).

Rhein Luftfahrtindustrie G.m.b.H.—Raab-Katzenstein RK.29 (Deutsche Motte)—Siemens S.H.14 or Argus As.8—(Raab).

Paul Ebner—D.H. Moth—98 h.p. D.H. Gipsy I—(Ebner).

Leichtflugzeugklub München—Phoenix L.2—72/89 h.p. Siemens S.H.13—(Schultes).

Dr. Von Langsdorff—Phoenix-Meteor—Seimens S.H.14—(V. Langsdorff).

Junkers Flugzeugwerk A.G.—Junkers Junior—80/88 h.p. Armstrong Siddeley Genet—(——).

Junkers Flugzeugwerk A.G.—Junkers Junior—Ditto—(——).

Osterr. Phoenix Flugzeugwerft G.m.b.H.—(Austrian) Phoenix-Meteor—Siemens S.H.14—(Kielhausen).

Ditto—Ditto—Ditto—(Guritzer).

Deutsche Verkhrsfliegerschule—B.F.W. 23b—80/100 h.p. Argus As.8—(Morzik).

Ditto—Arado L.2a—80/100 h.p. Argus—(Stutz).

Ditto—Albatros L.101—80/100 h.p. Argus—(Steindorff).

Düsseldorf Aeroclub—Klemm L.25.

Luftdienst G.m.b.H.—Klemm L.25a—40 h.p. Salmson—(Osterkamp).

Ditto—Klemm L.25e—80/100 h.p. Argus—(Poss).

F. W. Siebel—Klemm L.25e—80/100 h.p. Argus—(——).

Ditto—Klemm L.25e—80/100 h.p. Argus—(——).

Ing. Ferdinand Graf Starhemberg—B.F.W. M.23c—80/100 h.p. Argus—(Graf Starhemberg).

Frhr. von, Freyberg—B.F.W. M.23c—80/100 h.p. Argus—(——).

Bayerische Flugzeugwerke A.G.—B.F.W. M.23c—72/89 h.p. Siemen S.H.13 or 80/100 h.p. Argus—(——).

Ditto—Ditto—Ditto—(——).

Ditto—Ditto—Ditto—(——).

Ditto—Ditto—Ditto—(——).

Ditto—Ditto—Ditto—(——).

Ditto—Ditto—Ditto—(——).

Ditto—Ditto—Ditto—(——).

Ditto—Ditto—Ditto—(——).

Arado Handels G.m.b.H.—Arado L.IIa—72/89 h.p. Siemens S.H.13 or 80/100 h.p. Argus—(——).

Arado Handels G.m.b.H.—Arado L.IIa—72/89 h.p. Siemens S.H.13 or 80/100 h.p. Argus—(Peschke).

Ditto—Ditto—Ditto—(——).

Albatros Flugzeugwerke G.m.b.H.—Albatros L.100—Ditto—(——).

Ditto—Albatros L.101—105/115 h.p. Cirrus-Hermes—(——).

ROYAL AERO CLUB.

Cirrus Aero Engines Ltd.—Avro Avian—105/115 Cirrus-Hermes—(Thorn).

Robinson Aircraft Co. Ltd.—Robinson Redwing—75 h.p. A.B.C. Hornet—(——).

De Havilland Aircraft Co. Ltd.—D.H. Moth—100 h.p. Gipsy—(Broad).

Spartan Aircraft Ltd.—Arrow—Hermes or Gipsy—(——).

A. S. Butler—D.H. Moth—100/120 h.p. Gipsy—(Butler).

The Hon. Lady Bailey—D.H. Moth—Gipsy—Lady Bailey.

FRENCH AERO CLUB.

P. Mauboussin—Mauboussin—40 h.p. Salmson—(——).

Comte de Lambilly (Belgian)—St. Hubert—110 h.p. Walter—(Maus).

Ludovic Arrachart—Caudron 193—95 h.p. Renault—(——).

Aero Club de Royaume Yougoslave (Section Ljubljana (Jugo-Slav)—Bloudek XV—Cirrus II—(Colnar).

Edouard Albert—Albert A.61—95 h.p. Salmson—(Albert).

Mme. Denise Collin—Albert A.62—95 h.p. Renault—(——).

Maurice Finat—Dewoitine—95 h.p. Renault—(Finat).

E. Dewoitine—Ditto—Ditto—(Doret).

Gustave Douchy—Douchy— —— — (——).

Aéro-Club de l'Aisne—Caudron—95 h.p. Renault—(——).

Réné Caudron—Caudron 193—95 h.p. Renault—(Delmotte).

Guerchais et Henriot—Guerchais-Henriot 5—Ditto—(Bapt).

Jean de Permangle—Farman 220—Ditto—(Lallouette or Permangle).

Club Aéronautique Universitaire—Ducout.

POLISH AERO CLUB.

State Aircraft Works, Warsaw—P.Z.L.5—85/100 h.p. D.H. Gipsy—(Gedgowd).

Ditto—Ditto—Ditto—(Orlinski).

Komitet Wojewodzki L.O.P.P.—D.K.D.V—Cirrus III—(Dzialowski).

Aeroklub Akademicki w Krakowie—S.I—Cirrus II—(Piotrowski).

Podlaska Wytwornia Samolotow—P.W.S.8—85 h.p. Walter Vega—(Dudzinski).

Ditto—P.W.S.50—Cirrus III—(Babinski).

Ditto—P.W.S.51—Armstrong Siddeley Genet—(Lewoniewski).

Ditto—P.W.S.52—D.H. Gipsy—(Rutkowski).

Aeroklub Rzeczypospolitej Polskiej—R.W.D.4—105/115 h.p. Cirrus-Hermes—(Zwirko).

Ditto—Ditto—Ditto—(Karpinski).

Ditto—Ditto—Ditto—(Bajan).

Ditto—R.W.D.2—40 h.p. Salmson—(Plonczynski).

Ditto—Ditto—Ditto—(Wieckowski).

Ditto—Ditto—Ditto—(Muslewski).

Lubelski Klub Lotniszy—L.K.L.2—85 h.p. Walter Vega—(Szulczewski).

Ditto—Ditto—Ditto—(Zeromski).

SWISS AERO CLUB.

Jean Broccard, Martigny-Ville and Jean René Pierroz—Breda 15—110 h.p. Walter Vega—(Pierroz).

Charles Kolp (Netherlands)—Klemm L.25—80/100 h.p. Argus As.8 (Kolp).

Dr. Friedrich Hansen—Müller G.M.G.—40 h.p. Statax—(Hansen).

Dipl. Ing. Hugo Schmid—Korsa I-II—50 h.p. Anzani—(Schmid).

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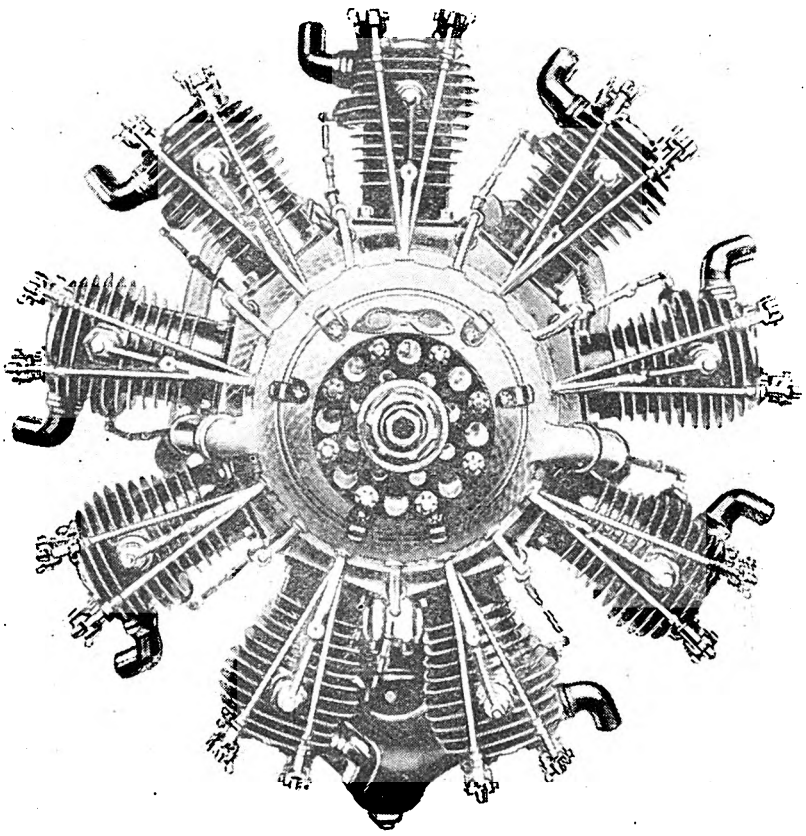
BRITISH SALMSON
AERO ENGINES

RELIABILITY AND SMOOTH RUNNING.

40-50 H.P.

60-75 H.P.



95-110 H.P.

120-140 H.P.

TYPE AD9. 40-50 H.P.

THESE ENGINES CAN NOW BE SUPPLIED WITH ALL NECESSARY CERTIFICATES

BRITISH SALMSON AERO ENGINES Ltd.
CHURCH WHARF,
CHISWICK.

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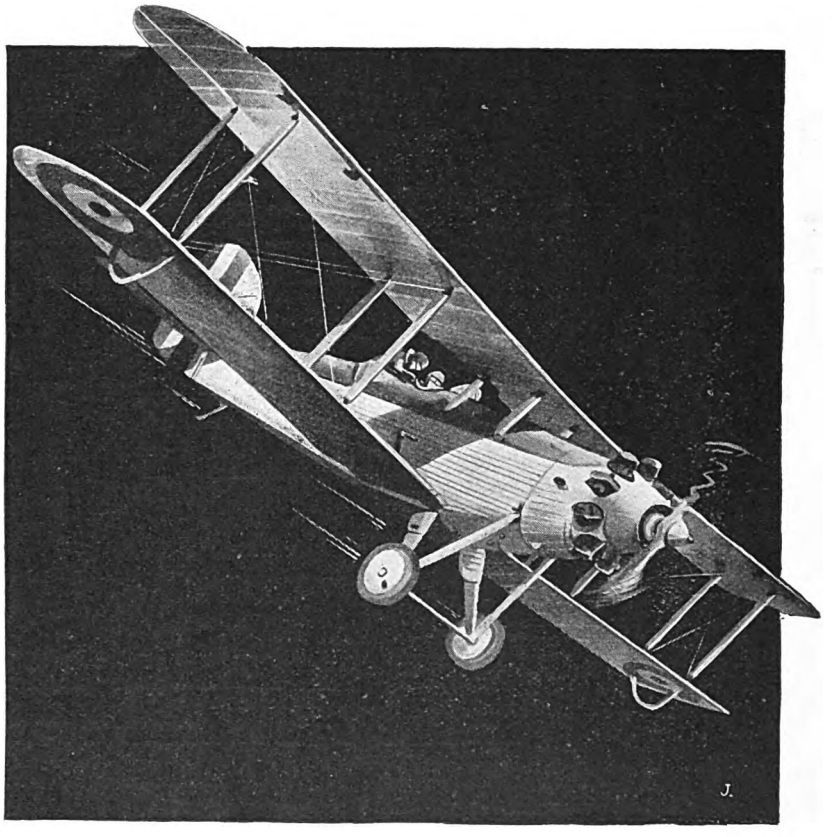

WESTLAND WAPITI MARK IIa, WITH JUPITER VIII ENGINE.

Westland Aircraft represent the latest developments in design and construction. The Westland Aircraft Works is equipped for the production of commercial and military machines of outstanding efficiency. The latest productions include the Westland Wapiti IIA, a general purpose aircraft; the Westland Three-Engined Limousine; the Westland Wizard II High Speed Single Seater Fighter, etc.

On March 23rd, a R.A.A.F. Wapiti, starting from scratch, won the Adelaide Aerial Derby covering the 40 mile circular course in 19 minutes, 2 seconds.

WESTLAND AIRCRAFT

AS SUPPLIED TO THE R.A.F., R.A.A.F., S.A.A.F.

WESTLAND AIRCRAFT WORKS

(Branch of Petters Limited),

YEOVIL, ENGLAND.

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COMMERCIAL AERONAUTICS.

THE A.I.D.T.S A. DINNER.

On May 2 the Aeronautical Inspection Department, Technical Staff Association, held their fifth Annual Dinner.

AIR MARSHAL SIR JOHN HIGGINS, K.C.B., K.B.E., D.S.O., A.F.C., proposed the toast of the A.I.D. He explained the fact that he was wearing the lately-designed A.I.D. tie by the fact that as the A.I.D. was part of his department, part of him must belong to the A.I.D. He said that he had a very natural pride in A.I.D. achievements, and, if he appeared to be giving himself a pat on the back, it was merely in an honest effort to do justice to the work of the A.I.D., and not because of lack of modesty. He said that the variety of the Department's work was increasing and so was the volume, but the quality of the work was no less good, and they had reason to be proud of the standard which they set.

Among their new work was the job of looking after the airships. The designers of the ships had been publicly praised, and so had the builders, but nothing had been said about the A.I.D., who superintended the job. Therefore they would be glad to hear that R.100, in her projected trip to Canada, would take a representative of the A.I.D. with her. This, he thought, was wise, for otherwise the R.100 would not sleep quietly at her mast, and would cry for her nurse.

As an example of the A.I.D.'s versatility he mentioned the fact that three years ago aircraft were nearly all made of wood; now they were nearly all made of metal, but the A.I.D. had changed their system so easily and quickly that the change was not noticed, and the A.I.D. itself had stood the change with marked ability.

Sir John referred to the happy relations of the A.I.D. with the various firms in which they worked. He remarked that the extension of our air routes to the Middle East and India had brought new responsibilities to the Department. Other countries, such as Japan, realising the high standard of British inspection, had demanded to be taught our methods, and he said that he would like to know whether Portugal, about which country he had read so much in THE AEROPLANE, had inspection methods like those of the A.I.D.

LIEUT.-COLONEL H. W. S. OUTRAM, C.B.E., A.R.S.M., Director of Aeronautical Inspection, said that each year the A.I.D. grew a little bigger, but it did not grow as rapidly as did the output of aircraft. He said that all this new activity in Civil Aviation meant making new friends in new firms, all of whom the A.I.D. were glad to meet. In this connection he was glad to note the first appearance at the A.I.D. Dinner of Air Vice-Marshal Sir Sefton Brancker.

As an example of the all-round ability of the A.I.D., he mentioned that when two new assistant inspectors were wanted for the airships they found already in the A.I.D. two men, one of whom had started on airship work in 1913 and the other in 1915. He also mentioned how when some time ago he was visiting the Stores Depot at Kidbrooke, where the furniture of the official buildings had to be passed by the A.I.D., one of the officers asked him how he proposed to judge the airworthiness of an American organ in one of the public rooms. He turned to one of the several members of his staff who were with him, and asked him whether he would mind playing a few chords, whereupon the official sat down and played quite expertly—he happened by chance to be an expert organist.

In conclusion, Colonel Outram said, "No one else in the world but ourselves knows how far from perfection we are"—which is quite a handsome admission, seeing that there is nobody who is entitled to pass judgment on the A.I.D.

Mr. J. J. A. GILMORE, Chairman of the A.I.D., T.S.A., proposing "The Guests," said that he was proud to have the privilege of asking the Under-Secretary of State for Air and Sir Sefton Brancker to this gathering. Their presence showed how the importance of the A.I.D. had grown. He pointed out that Mr. Montague now frequently indulged in this new rash form of transport, but, knowing of the existence of the A.I.D., Mr. Montague knew that he was taking no risks.

Mr. Gilmore gave full credit to Sir Sefton Brancker for pushing airmindedness in the British Empire. Sir Sefton was often referred to in the newspapers as "The Air Chief," and he thoroughly deserved the title. But the papers were apt to call the A.I.D. bureaucrats. He recalled the fact that Sir John Higgins and Mr. McAnally had been present at all five A.I.D. Dinners. He mentioned the fact that all the big aircraft firms which composed the Society of British Aircraft Constructors were represented at that Dinner, and he remarked that though some people were in favour of Air Ministry control, they would certainly not be in favour of the removal of the Air Ministry.

Incidentally, he told a pleasing story of a friend of his who referred in the course of conversation to pro-War whiskey. When the suggestion was made to him that he meant pre-War whiskey he said that he did not; what he meant was pro-War whiskey, the fighting spirit.

THE RIGHT HONOURABLE FREDERICK MONTAGUE, Under-Secretary of State for Air, said that since he had come to the Air Ministry he had discovered a new angle of mental interest. He remarked that some time ago a friend of his had wanted to know why our airships bore numbers instead of names. He suggested that in view of Sir John Higgins' fear that R.100 would not sleep at its moorings, it might be named after Sir Sefton Brancker.

Referring to a suggestion that the pay of the A.I.D. might be raised, he said that he was not hopeful about persuading any more money out of the Treasury for the present.

SIR SEFTON BRANCKER, also replying for the guests, recalled the fact that some time ago, when he was President of the Royal Aeronautical Society, somebody had referred to him as being ignorant but useful, and he was content if he was regarded as useful. Apropos of speech-making as a whole, he recalled the statement of a youthful American who said, "Elocution is what we do to our criminal murderers."

Sir Sefton recalled the genesis of the A.I.D., and gave credit for its parentage to the late General Sir David Henderson and to Lieut.-Col. Mervyn O'Gorman. He said that the Department was responsible for the high reputation of British aircraft all over the world. He remarked that Admiral Lord Beatty's recent attacks on the Air Ministry seemed to be a bit old-fashioned. The A.I.D. might be regarded as the Silent Service of Aviation.

Mr. C. G. GREY, also called upon to reply for the guests, remarking that making speeches after two such orators as Mr. Montague and Sir Sefton Brancker was no man's job, said that the A.I.D. stamp was the hall-mark of British aircraft. There were certain Bolsheviks who were in favour of abolishing all Government control of aviation. If such control were abolished the Aircraft Industry would still insist on the continued existence of the A.I.D. for the sake of that hall-mark.

If he had been a speechmaker, which he is not, he might have added that the greatest credit for the formation of the A.I.D. should be given to the late Lieut.-Col. J. D. B. Fulton R.A., the first British officer who ever flew in His Majesty's Service, and that the gathering that night would have rejoiced Colonel Fulton's heart. Also he might have stated that though Portuguese methods of inspection have not been learned directly from the A.I.D., they have been based on methods laid down by Vickers, Ltd., for aeroplanes which are being built by the Portuguese Army to Vickers' designs, and so are indirectly A.I.D. methods. Also he might have remarked that in all Government Departments rises in pay are apparently measured by His Majesty's Treasury with a micrometer, in spite of the fact that the Treasury helps itself out of the taxpayer's pocket with grab-shovels.

Mr. H. W. W. MCANALLY, C.B., proposed the toast of "The A.I.D. Technical Staff Association," which is a branch of the Institution of Professional Civil Servants, an institution which covers the technical sides of all the King's Services.

Mr. R. W. SLOLEY, Secretary of the A.I.D.T.S.A., replied.

THE DEMONSTRATOR.—Mr. Neville Stack (and his Hermes-engined Avian) who has just joined the staff of Smith's Aircraft Instruments, of Great Portland Street.—(*"Aeroplane" photograph.*)

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HONOURS EASY.

The first general report of the Guild of Air Pilots and Navigators, which was published in THE AEROPLANE for Apr. 16, stated that the Guild had resolved to afford financial support to one of its members, who, on behalf of himself and many other pilots, was fighting a test case.

According to the report of the case, which appeared in *The Times*, the respondent, Mr. Leslie Allan Walters, appealed against an assessment to income-tax of £918 10s. for the year ended Apr. 5, 1928, under Schedule E. of the Income Tax Acts. The question for the Court was whether £200 claimed by the respondent in respect of certain expenses was an allowable deduction. Certain items forming part of that amount, in respect of special equipment and fees, were conceded by the Crown before the case was heard.

Mr. Walters was employed as a pilot of aeroplanes by Imperial Airways Ltd., under an agreement dated Nov. 9, 1925.

The respondent contended (*a*) that the amounts expended by him over and above the company's flat rate for subsistence allowance were expenses which he was necessarily obliged to incur and defray out of the emoluments of his office in the performance of his duties and, therefore, a proper claim under the first part of Rule 9 of the Schedule E Rules; and (*b*) that a due proportion of the expenses of the motor-car and telephone were moneys wholly, exclusively, and necessarily expended in the performance of the duties, and, therefore, also a proper claim within the latter part of Rule 9.

It was contended by the Crown (*a*) that the company's flat rate was sufficient, and that any excess was not a reasonable and necessary expense; and (*b*) that the expenses of the upkeep of a motor-car and telephone were not expenses wholly, exclusively, and necessarily incurred in the performance of his duties.

Mr. Justice Rowlatt, in giving judgment, said that, as a matter of principle, the rule to be applied was clear. What the statute allowed to be deducted were "expenses of travelling in the performance of the duties of the office or employment," or money expended "wholly, exclusively, and necessarily in the performance of the said duties." With regard to the latter part, it seemed clear that what was allowed to be deducted was expenses "wholly, exclusively, and necessarily" incurred in doing the work of the office or employment; in doing those things which it was his duty to do.

The holder of the office had equally necessarily to do other things and to expend money incidentally because he held the office or employment. He had to get there, but that was not doing the work of the office or employment which began when he got there. In the present case he thought that the respondent could not be allowed the cost of the motor-car. It was true that he could not live at the aerodrome, and that he had to get there often at uncertain times, but while so doing he was not performing the office, but preparing to perform it. The telephone was in the same position. It was a question of maintaining communication with a view to his getting to his employment. The Commissioners were judges of fact, and on the question of necessity the Court could only overrule them if it could be shown that the expenses were not expenses in the performance of the office, and must be disallowed as matter of law.

On the other part of the case the respondent's actual duty was to travel, and he was entitled to be allowed the expenses of so travelling. Those expenses included the extra expenses incurred by him in staying at hotels instead of eating and sleeping at home. It really came to be a question of quantum, and as a matter of law he could not say that the Commissioners were wrong or set aside their decision.

He would add, however, that it was the duty of the Commissioners to watch claims of this sort very carefully, and in this case he felt a little misgiving about their decision, especially as they had indulged in mere declamation. In the result the Crown succeeded as to the motor-car and telephone and failed as to the travelling expenses. There would, therefore, be no order as to costs.

SOLID INJECTION FOR PETROL ENGINES.

The use of so-called solid injection— which is not solid at all but is in reality the pumping of a spray of fuel directly into the combustion-space of internal combustion engines,— is no novelty. This system of supplying fuel to the cylinders has been used in experimental laboratories for some time. It has the advantage of exactly measuring the amount of fuel which is supplied to each cylinder,—a feature of importance for some research work.

So far the system has not been used in standard aircraft engines, until the production of the Packard Diesel Engine, which was described in THE AEROPLANE for Apr. 30. A fuel supply of this kind is a necessity in a Diesel or compression-ignition engine, as combustion is not started until the spray of fuel meets the superheated air. This air is raised to the requisite temperature by using a high compression ratio,— nearly three times that normally used by standard aero-engines.

The use of solid injection has other advantages. A separate pump can supply fuel to each cylinder, which means that a failure in the fuel system is more likely to be localised. Carburettors have a habit of "icing-up" in cold weather and are not at their best when inverted. Less volatile fuels than petrol can be used with a solid-injection system, as complete atomisation is assured by the use of a nozzle and pump, instead of vapourisation from a jet.

One of the difficulties that arise from the application of solid-injection to aero-engines is the very short time available (a few thousandths of a second) for the adequate mixing of the spray of fuel with the compressed charge of air. But much has been learned about turbulence and the way in which the initial spark or flame is transmitted through the charge as combustion takes place.

This knowledge has progressed so far that engines can now be designed with enough turbulence to ensure rapid enough mixing of the fuel-spray even in compression-ignition engines.

The Pratt and Whitney Aircraft Co., in the United States, have developed a system of solid fuel-injection for the normal aero-engine which does away with the carburettor and intake manifolds.

In their place are substituted fuel pumps which inject a spray of fuel into each cylinder. This spray mixes with the air which has been drawn into the cylinder through the normal inlet valve. This system is intended for the electrically ignited engine and therefore the high-cylinder pressures which are necessary for the compression-ignition engines are not used. No radical modification in design is therefore necessary.

The new system was publicly demonstrated in the early part of April by the test-pilot of the Pratt and Whitney Company. He flew a Boeing single-seat fighter with a standard Pratt and Whitney Wasp from which the carburettor and induction pipes had been removed and in which the new injection system had been substituted.

The new system is the same weight as that of the system it replaces. The horse-power of the engine is unchanged.

During these tests aviation petrol was carried in one tank and furnace oil in another, so that each test could be made on each fuel. The tests were reported to have been satisfactory and to have demonstrated the advantages of the system, which makes possible the use of heavy oil in the normal type of aero-engine.

The engine was cooled by being flown at a high altitude at low r.p.m., the pilot then dived the machine with the engine throttled back. When near the ground the throttle was opened and the machine pulled out of the dive. The engine responded well on both fuels and there was a lack of the spluttering which might have been expected.

A K.L.M. SERVICE TO AUSTRALIA.

A report from Sydney says that a representative of the K.N.I.L.M. states that his company have decided to start in October, when their Holland-Java service will reopen, a service between Sourabaya, Darwin, Brisbane and Sydney. Australia will thus be brought within three weeks of Holland and England.

Any comment to the effect that an air-line of such importance ought to have been inaugurated by the British would be idle. Our one and only subsidised air transport company is already hard at work, no doubt. Probably plans for the operation of this route in 1935 at a cruising speed of 80 m.p.h. are already drawn up.

THE LAST LINK.

When Monsieur Grimault read his paper before The Royal Aeronautical Society on April 3, as reported in THE AEROPLANE for April 9, he said that this Summer attempts would be made to fly between Dakar on the West African coast and Natal in Brazil with the mails which are at present carried in more-or-less fast packet-boats. On May 1 the first batch of mail destined to be flown across the Atlantic on a regular service left Marseilles.

The crossing is to be made in a Latécoère 28 monoplane (600 h.p. Hispano-Suiza engine) with a float undercarriage. The distance between Dakar and Natal is nearly 2,000 miles. Recently the L.A.T.-28 with a float undercarriage covered in a closed circuit 4,308 km. (about 2,670 miles) in 30 hrs. 25 min.

As the weather in the South Atlantic is uniformly good, and the "Portuguese Trade,"—a strong wind from the N.E.,—blows constantly in those latitudes, the trip should be a success. The true proof of success will be a succession of successful flights in the opposite direction.

Probably the next move will be the annexation of St. Paul's Rocks by France, and the building there of a landing platform for aeroplanes, with the money still owing for war-debts.

THE SAFE TRANSPORT OF BULLION.

Mr. Campbell Black, the energetic Managing Director of Wilson Airways which is doing the spade-work in pioneering aviation in Kenya, is forming a habit of making flights which show the value of aerial transport.

For a long time air transport has been recognised as the best method of moving bullion. The insurance premiums for this form of transport are less than those for any other method, partly because of the decreased risk of robbery. The amount of gold carried by Imperial Airways has now reached a surprising total. For some years aircraft have been used in New Guinea to carry gold from the mines at Wau to the coast. As a matter of fact, in New Guinea aircraft are used for taking up all supplies to the mines.

A long time ago Mr. Samuel Evans, Chairman of the Crown Mines, one of the biggest South African producers, drew attention to the value of air transport for gold mines.

Mr. Campbell Black recently flew to Kurungu, on Lake Victoria, from Nairobi and collected over £700 worth of gold. The journey, which normally takes two days, was flown in three hours.

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LA FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE
HAVE GRANTED THE FOLLOWING

WORLD'S RECORDS

GREATEST SPEED OVER
100 KILOMETRES.
FLYING OFFICER H.R.D.WAGHORN,
ON
SUPERMARINE ROLLS-ROYCE S.6.
7TH SEPT.,1929.
330·1 M.P.H. 531·200 K.P.H.

FLYING OFFICER R.L.R.ATCHERLEY,
ON
SUPERMARINE
ROLLS-ROYCE S.6.
7TH SEPT. 1929,
331·6 M.P.H.
533·800 K.P.H.

SUPERMARINE

WORLD'S
GREATEST
SPEED

SQUADRON LDR.
A.H.ORLEBAR, A.F.C.
ON
SUPERMARINE
ROLLS-ROYCE S.6
12th SEPT.,1929.
357·7 M.P.H. 575·700 K.P.H.

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RELIABILITY OF THE DESIGN AND
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THE INSTITUTE OF TRANSPORT.

The Institute of Transport announces that its Eleventh Annual Dinner will take place at the Connaught Rooms, Great Queen Street, London, W.C.2, on Thursday, Mar. 5, 1931.

DANCING ON AIR (NEW STYLE)

On May 2 Herr Alwin Schmid, who is a wealthy Swiss, chartered the *Graf Zeppelin* to take himself and 36 friends for a trip over Switzerland. This is probably the first event of a season rich in such episodes. One has heard rumours of a hostess who is trying to hold a dance in an airship. One can only hope that for such an occasion guests would abstain from their usual haphazard habits with cigarette-ends, otherwise the party would probably end in a way better suited to November, with fireworks and a bonfire.

CROYDON NOTES.

A pen, much mightier than the thing resembling a sword with a crossed nib, which Spry habitually affects [not to mention a type-writer which seems to be a cross between a ticket-punch and a pile-driver.—ED.], has chronicled the arrival of the Duchess of Bedford at Croydon last week, and has recorded all the admiration that everybody feels for that remarkably fine flight.

We at Croydon regard the Duchess with amazed reverence, and Capt. Barnard with the utmost respect as a pilot, but since Mr. Bob Little is particularly "one of us" we are more than a little elated with the fine show he put up as navigator, second pilot, and, above all, as engineer to the flight.

"We looks towards you, Bob; likewise we bows—here's luck."

While the Duchess, Capt. Barnard and Mr. Little were struggling with the throng on the tarmac, the situation was suddenly dominated by the skipper of the Pathé Sound Unit, who, from his bridge far above the crowd, manœuvred his craft about with consummate skill. He used a telephone between bridge and engine-room for the transmission of such nautical orders as "helm a lee" (never mind the crowd), "hard a starboard" (was that a bloke or a dog?), and so forth.

Having got his ship to the required position, incidentally winding his cable round the ankles of sundry bystanders, he went through the whole of the flight in dumb show, in order to get the now thoroughly fascinated crowd to cheer heartily while he took their picture.

Eventually he ended up a perfect display by peremptorily calling for silence, and gravely remarking in a sonorous voice, "Thank you very much, Lady Bailey."

After this he went ashore, leaving a junior officer, a sort of second mate, in charge of heaving the anchor, or stowing the cable.

It was a perfect display of nautical efficiency, and we imagine he has already received offers from the Cunard Line, requesting him to come and take over their largest liner by the first train.

Wednesday was a great day for the K.L.M. First came the Duchess of Bedford in an ex-member of the K.L.M. commercial fleet, then arrived the Burgomaster of Amsterdam by the K.L.M. morning machine, on a visit to the Lord Mayor of London. The Burgomaster wears a white moustache and imperial, and, despite his bowler hat, reminds one at once of a Franz Hals portrait.

By the evening K.L.M. machine came the Postmaster-General of Holland, and Mr. and Mrs. Jack Hylton.

Old hands at the Aerodrome, we may even say very old hands, will remember Daddy Game of Airco days. He and Mrs. Game, both looking several years younger, turned up just as we were sort of going to press. Daddy Game has been doing intensive duck-farming since he gave up flying, and is understood to have bred a phenomenal duck answering to the name of D.H.16, and living largely on ale, according to the Airco tradition.

An Egyptian King's Messenger, armed *cap-à-pied* in tarboosh and patent leather shoes, no doubt, according to immemorial custom (see wall paintings, tomb of TUT-ING-BEC dated B.C.3), got lost recently in the changeless East somewhere and had to be retrieved (after he had missed the Indian Air Mail) by Capt. Wilcockson, of Imperial Airways, in a D.H.50. Descending at Catania last Friday evening like a quail with a ration of manna Capt. Wilcockson met the courier who had come from Syracuse by road. On Saturday morning he left for London with his passenger and reached Pisa in due course.

Like the dove from the Ark, he could find no place for the sole of his foot (or the wheels of his undercarriage) and had to land splash on the face of the waters there. When he arrived at Croydon he found a cable which had been following him about, which read "Pisa flooded, land Sarzana, near Spezia."

After due consideration, he decided not to obey these instructions, and went and had a cup of tea in the Buffet instead.

The A.I.D. Dinner on Friday night last was a huge success, according to the evidence afforded by those who cooled their brows in the breeze from airscrews on Saturday morning. We wonder whether Sir Vice-Marshal Brancker's scientific theory about the Severn tunnel will hold good for the Channel tunnel, more so, we should imagine.

You cannot go about saying POP! to harassed people whose starting apparatus has just exploded on the Tarmac, nor can you exclaim Tinkle! Tinkle! as the pieces fly all over the Customs Area. At least—not if you are nice to know.—SPRY.

THE DESOUTTER SPORTS COUPE.

The Desoutter Aircraft Co. Ltd. have recently issued a most attractive booklet which describes the merits of the Desoutter Sports Coupé with the Cirrus—Hermes engine. The booklet starts, as all good histories should, with the pre-historic and reminds people that in pre-war days Mr. Marcel Desoutter was well-known as a pilot of Blériot monoplanes at Hendon and that Mr. G. H. Handasyde, who is now General Manager of the firm, built the famous Martinsyde monoplane at Brooklands.

The Sports Coupé is produced in quantities, and spares are readily available. Any parts from a complete wing to a shoe for the tail-skid, can be supplied to fit any Desoutter Sports Coupé built. Because National Flying Services Ltd. are the sole distributing agents in the British Isles for this machine, at every N.F.S. aerodrome one can obtain Desoutter Service and Spares.

The booklet goes on to tell of the speed-range of the Desoutter from 50 to 114 m.p.h.; it tells of its big disposable load of 700 lbs., of which only 170 lbs. are absorbed by 20 gallons of fuel and the necessary oil; and it tells how easy the machine is to fly.

The booklet lays emphasis on the comfort of the machine, on the design of the undercarriage whose wide track assures a steady landing, and on the machine's reliability and low cost of maintenance.

For £875 one can buy complete this three-seat high-wing cabin monoplane with a speed-range of 50 to 114 m.p.h., a ceiling between 16,000 and 18,000 ft. and a climb of nearly 1,000 feet in the first minute. There are three standard colour-schemes: Red and Silver, Green and Ivory, or Blue and Silver, but others can be had for the asking.

Mr. W. E. John's Aircraft and Fine Art Company, who have produced this booklet, are to be congratulated. The cover is a really striking design.

Copies of this excellent booklet can be obtained by writing for them from the Desoutter Aircraft Co. Ltd., Croydon Aerodrome, Surrey.

SCINTILLA SERVICE FOR THE MIDLANDS.

Scintilla Ltd., the famous firm of magneto manufacturers, have opened a branch office at 19-21, Somers Street, Leeds. This has been established for the convenience of customers of the firm in the North of England and is complete with a fully equipped service depot and trained technical staff.

A FLIGHT TO THE CAPE ON SPEEDOLENE.

On Feb. 20 Silvertown Lubricants Ltd. were informed that Mr. Alan Butler, Chairman of the Aircraft Operating Co. Ltd. was going to fly to Cape Town on the Gloster Survey machine (two Bristol Jupiter engines) and that he must have Silvertown's Speedolene P.4 lubricating oil. Within four weeks Silvertown Lubricants Ltd. had made the necessary arrangements and from the start of his flight at Heston, to the finish at Cape Town, Mr. Butler found supplies of Speedolene P.4 all along his route.

On Apr. 15 Silvertown Lubricants Ltd. received a telegram from Mr. Butler as follows:—

MALLITE PLYWOOD
USED BY THE LEADING AIRCRAFT MANUFACTURERS
THROUGHOUT THE WORLD.
TELEPHONE: BISHOPSGATE 5641 (4 LINES)
MANUFACTURED TO SPECIFICATION S.V.S. BY:-
THE AERONAUTICAL & PANEL PLYWOOD Co. LTD 218/226, KINGSLAND Rd., LONDON. E.2.
TELEGRAMS: "VICPLY, KINLAND, LONDON."

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Arrived Cape Town. Stop. Your oil giving complete satisfaction. Your representatives and organisation both hospitable and efficient.

Speedolene P.4 satisfies the requirements of the Air Ministry Specification D.T.D. 109 and is used by the R.A.F. The oil is also used, approved and recommended by Armstrong Siddeley Motors Ltd. for their Leopard, Jaguar, Lynx and Genet engines; by the De Havilland Company Ltd. for their Gipsy engines; by the Cirrus Aero-Engines Ltd. for their Cirrus and Cirrus-Hermes engines; and the Bristol Aeroplane Company Ltd. for their Jupiter and Lucifer engines.

Speedolene P.4 is an oil with a mineral base, as opposed to the lubricating oils with a vegetable base which have for so long been used for aero-engines. As foreshadowed in Mr. F. A. Foord's paper on Lubrication, which was reported in THE AEROPLANE for May 29, 1929, oils with a mineral base are becoming more and more widely used.

A SIGN OF THE TIMES.

James Hunter Ltd., the world-famous turf-seed specialists of Chester, have produced an attractive booklet under the title "The World Made Greener." The object of this is to help people to understand the work of those who construct aerodromes and air-parks, racecourses, golf-courses and cricket, football and tennis grounds.

The point of particular interest is the fact that a firm of this magnitude should realise the need for Air-Parks. The foreword of this booklet says:—

> The pressing urge of the moment, and of the immediate future, however, for a great increase in the facilities for civil flying, seems to place the provision of air-parks in the forefront of modern construction from the standpoints of both Sport and Business or a combination of the two.

The writer goes on to say that the firm think the day is not far distant when every racecourse and golf-course will provide accommodation for air-minded sportsmen.

The firm have a special department, under the personal supervision of their Governing Director, Mr. C. P. Hunter, for the construction of aerodromes.

During the War 1914-18 the firm constructed and/or seeded down more than 35 aerodromes and landing grounds. As a result they gained from this an enormous store of experience on which they draw in this booklet to give some hints on Aerodrome Construction.

In it they deal with the selection of a site, with the best method of drainage for a particular soil and the way "the rough places may be made smooth."

Mr. C. P. Hunter is a business man who believes in the value of flying as a means to save time. In fact the first time the writer met him Mr. Hunter had flown over to Croydon to see a demonstration of agricultural machinery. Mr. Hunter loves flying for its own sake and owns a Klemm (40 h.p. Salmson engine) which he flies himself. This machine is often to be seen at Heston Air-Park, the landing field of which was constructed by Mr. Hunter's firm.

FOR GOOD LUBRICATION.—The Gloster Survey biplane (two Bristol Jupiter geared engines) being filled up with Silvertown Speedolene oil at Heston before starting on its African flight.

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Competitive in price . . . . .

Dopes for all climatic conditions

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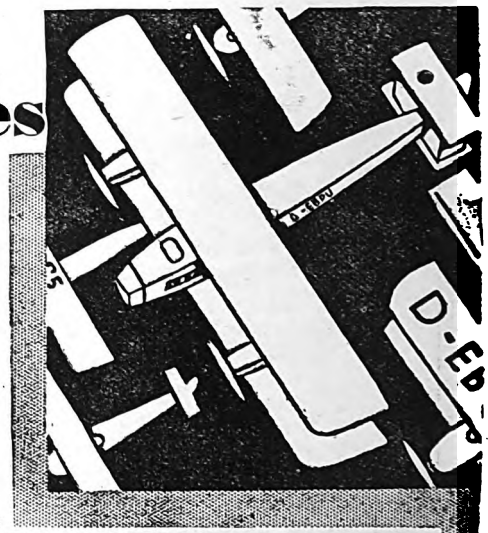

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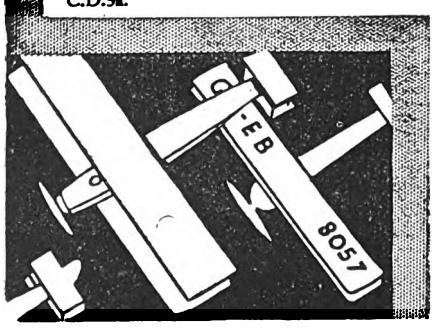

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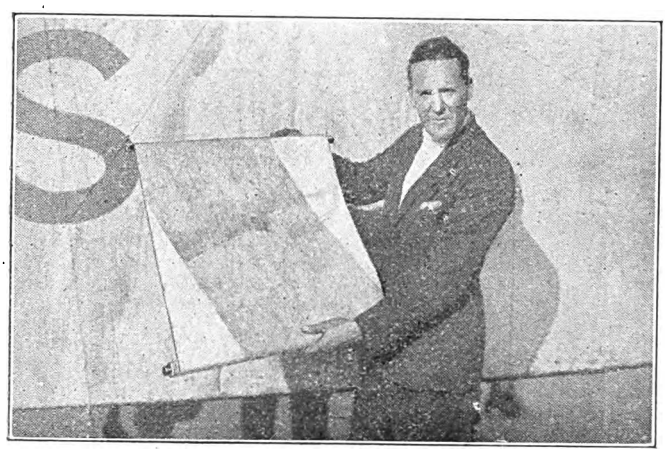
Stanford's Maps in the "Spider"



Captain Barnard's Tribute

"Tell Stanford's their maps so neatly made helped considerably towards success flight."

Barnard.

Another distinguished name added to the long list of record-breakers who have carried Stanford's maps. Like Sir Alan Cobham, Lady Heath, Mr. Van Lear Black and others, Captain Barnard appreciates the clearness and accuracy, the patent weather-proofing and handy mounting that have made Stanford's the standard maps for exacting flights.

Light plane owners are invited to call at the British H.Q. for Air Route maps (addr ss below) and see the kind of map that has guided these famous pilots. They will find the unique mounting solves one o their long standing problems.

STANFORD'S for Maps

EDWARD STANFORD LTD.

Whitehall House, 29-30, Charing Cross, S.W.1 and 12, 13 and 14, Long Acre, W.C.2.

After the article on the construction of aerodromes, the booklet contains some extracts from Mr. Norman Macmillan's book, "Into the Blue," which are calculated to induce the first degree of air-mindedness, that of interest, in the minds of the most conservative.

Besides giving a lot of useful information about golf-courses, lawns, racecourses and other grounds *pour le sport*, the booklet closes with an illustrated catalogue of grass-seeds. This catalogue first effectively dispels the idea that grass-seeds are much of a muchness and next tells one which grass to use for any specific purpose.

Everybody who is interested in the construction of aerodromes and landing grounds, especially municipal engineers, should get a copy of this booklet. They will find it worth while, and an aid towards overcoming the problems they will have to face. The address of the firm is James Hunter Ltd., Turf Specialists, Chester, or at Heston Air-Park, Heston, Middlesex.

THE BOMBAY—KARACHI AIR MAIL.

In the House of Commons on Apr. 29, in reply to a question by Major Graham Pole, the Secretary of State for India said that proposals for the establishment of a regular service of mail-carrying aeroplanes connecting Bombay with Karachi had been received by the Government of India but a difficulty in the way of an early decision was that no aerodrome near Bombay fit for regular use throughout the year was at present available.

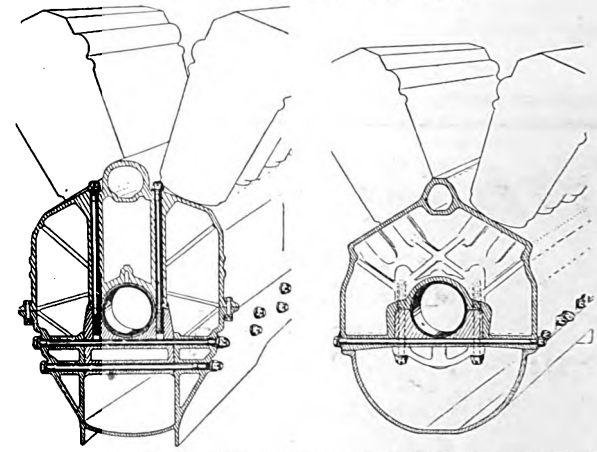
Lieut. Cmdr. Kenworthy suggested using seaplanes which could alight on the backwaters of the harbour at Bombay.

THE SURVEYORS REACH RIO

Mr. and Mrs. Alan Butler, who recently flew to Cape Town in the Gloster Survey biplane (two Jupiters) arrived at Rio de Janeiro, by boat, on April 29.

BY ERROR.

By an extraordinary mistake on the part of a printer's reader the descriptions underneath two of the illustrations in the article on the Rolls-Royce Condor III.B engine last week were transposed. The crank-case of the Condor III was described as the Condor III.B, and *vice versa*.



The accompanying illustration shows which is which. The Condor III, with the crank-shaft bearings held up by an arrangement of long bolts, is on the left. The Condor III.B, which has been simplified by building the bearings into the upper section of the crank-case and turning the lower section into a receptacle for oil, is on the right.

This simplification is one of the chief alterations made in the Condor III.B by way of improving on the Condor III, so the mistake is the more regrettable. The only consolation is that the mistake was made after the page had been passed in its correct form by the editorial staff of this paper.—C. G. G.

A FRONTIER INCIDENT.

The Berlin correspondent of *The Times* states that the Polish Foreign Minister, M. Zaleski, has expressed to the German Minister in Warsaw his Government's regret at the crossing of the frontier by Polish aircraft, which was the subject of an energetic German protest recently.

M. Zaleski informed the Minister that the authorities responsible had been called to account and an inquiry begun. He further assured Herr Rauscher that a Polish Note of October last, which undertook, in response to a similar protest, to punish the persons responsible and to take preventive measures, retained full force.

PEACEFUL PENETRATION.

According to *Le Journal de l'Aviation Française* three American military aviators have sailed for Greece. They will, over a period of four months, demonstrate certain American military and civil aircraft in Greece, Turkey, Poland, Norway, Sweden, Switzerland, Germany, and the Balkan States.

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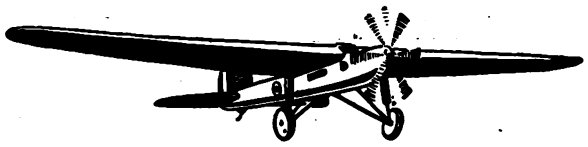

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A TIME SAVER.

An instance of economy on a short haul was given by *The Manchester Guardian* of Apr. 15. Mr. J. Utley is an engineer engaged simultaneously on the construction of a bridge at Northenden, Chesire, and on improvements to the Municipal Aerodrome at Barton,—which seems to be a euphemism for Chat Moss. He finds that he has to visit both places at short intervals, and although the distance is only a few miles, he takes forty minutes by road against five by air. He has arranged with Northern Air Lines Ltd. to take regular trips for the next few weeks at 9d. per mile. The advantage appears to be possible because one job is on an aerodrome and the other apparently has landing facilities close by.

Northern Air Lines use Avros, Moths and Avians.

A FORD INNOVATION.

The Ford Motor Co., of Detroit, Mich., has reduced the prices of the 4-AT and 5-AT Tri-motor aircraft, the former from £10,082 to £8,230, and the latter from £11,316 to £10,288.

The 4-AT may also be equipped with three 225 h.p. Packard-Diesel or three 300 h.p. Pratt and Whitney Wasp-Junior engines in place of the three Wright Whirlwind engines which are fitted as standard.

The 5-AT, which type was exhibited at the Aero Show at Olympia last year, has three 425 h.p. Pratt and Whitney Wasp engines as standard.

The Ford Company is the first to make the new Packard-Diesel radial air-cooled engine an optional power unit for its aircraft.

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The first directors are: C. W. Hayward, W. S. Stephenson and A. J. T. Taylor (deemed to have been appointed by the ordinary shareholders) and M. L. Bramson (deemed to have been appointed by the deferred shareholders). No share qualification required. Solicitors: Pinsent and Co., 6, Bennetts Hill, Birmingham.

PERSONAL.

Death.

STRATTON.—On Apr. 30, at the R.A.F. Camp, Halton, Lieut.-Col. H. W. Stratton.

Forthcoming Marriage.

IVELAW-CHAPMAN—SHORTT.—The engagement is announced between Flt. Lt. R. Ivelaw-Chapman, D.F.C., A.F.C., R.A.F., only son of Mr. and Mrs. J. Ivelaw-Chapman, Charlton Kings, Cheltenham, and Betty, only daughter of Mr. and Mrs. C. W. Shortt, Borough Green, Kent.

ROWE—PATTULLO.—The engagement is announced, and the marriage will take place in June, between Flt. Lt. Francis Charles Thorn Rowe, R.A.F., only son of Mr. and Mrs. C. F. Rowe, Mill End, Chagford, Devon, and Constance Isobel Pattullo, B.M., B.Ch.Oxf., 144 Harley Street, W., elder daughter of Mr. and Mrs. J. D. Pattullo, Hurst Lea, Albury Heath, Surrey.

Marriage.

MUNDAY—DE REUL.—On Apr. 26, in Brussels, Sq. Ldr. Richard Burnard Munday, D.S.C., A.F.C., R.A.F., elder son of Maj.-Gen. and Mrs. R. C. Munday, of Port Royal, Plymouth, to Marie Jose, eldest daughter of M. and Mme. de Reul, of 49, Boulevarde Brand-Whitloche, Bruxelles.

NORTON—MURRAY.—On Apr. 10, at the office of the Registrar, Frederick A. Norton, Flt. Lt., R.A.F., to Joan Murray.

Births.

JOHNSEN.—On Apr. 29, at Balcombe House, Balcombe, Sussex, to May (*née* Bowater), wife of Capt. O. C. W. Johnsen, D.F.C.,—a son.

MALET.—On Apr. 26, at a Nursing Home, Southampton, to Olga, wife of Sq. Ldr. H. G. R. Malet, R.A.F.—a daughter.

O'NEILL.—On Apr. 17, at the British Families' Hospital, Karachi, to Dorothy, wife of Sq. Ldr. C. T. O'Neill, R.A.F. Medical Service—a son.

STRUGNELL.—On Apr. 28, at Manston, Kent, to Cha, the wife of Wing Cdr. W. V. Strugnell, M.C., R.A.F.—a son.

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A. Peter Thurston and Co., Patent Agents, Aeronautical Consulting Engineers, 329, High Holborn, W.C.1. Telephone Holborn 2542.
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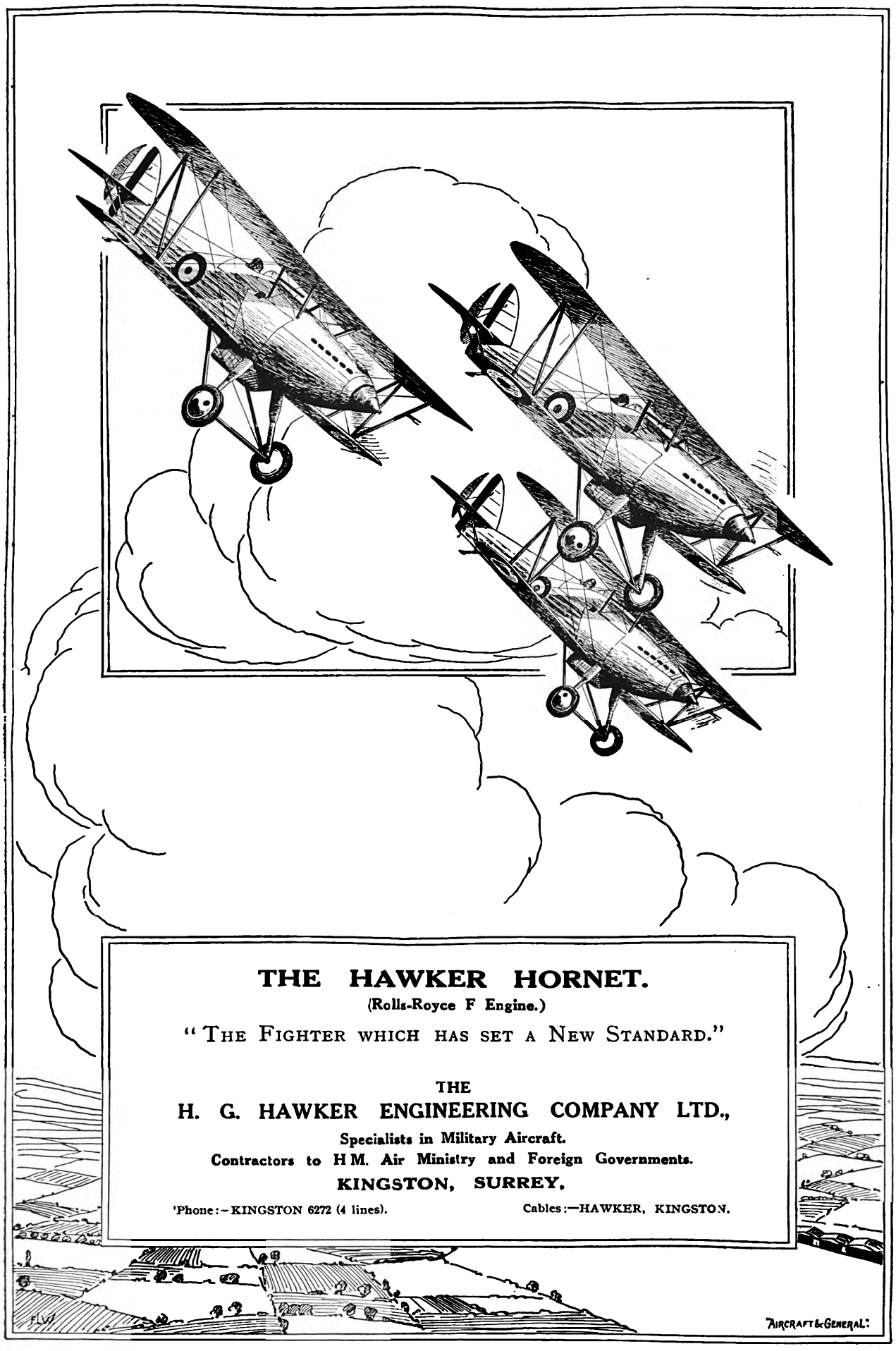

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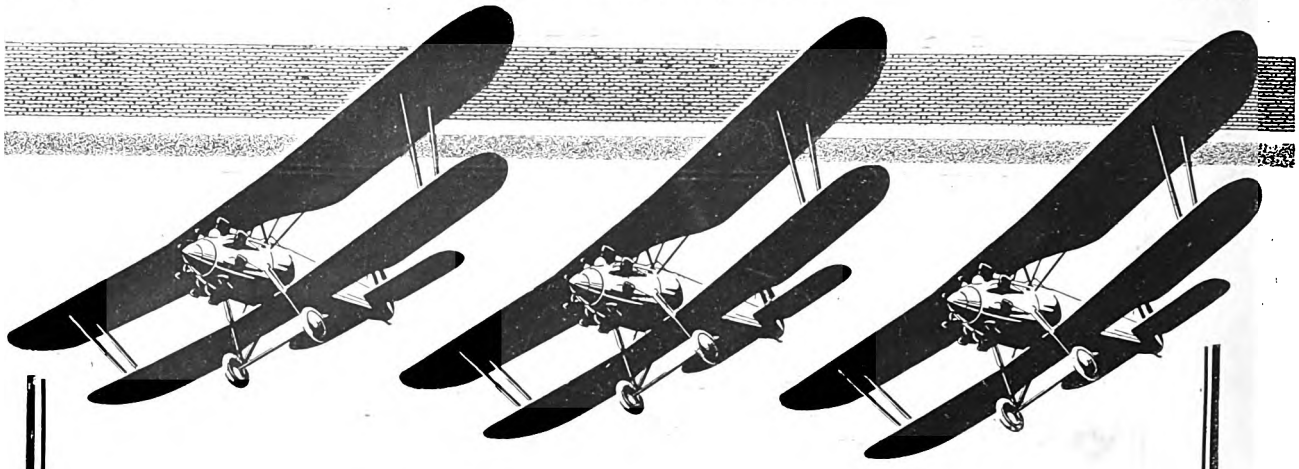

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THE AEROPLANE

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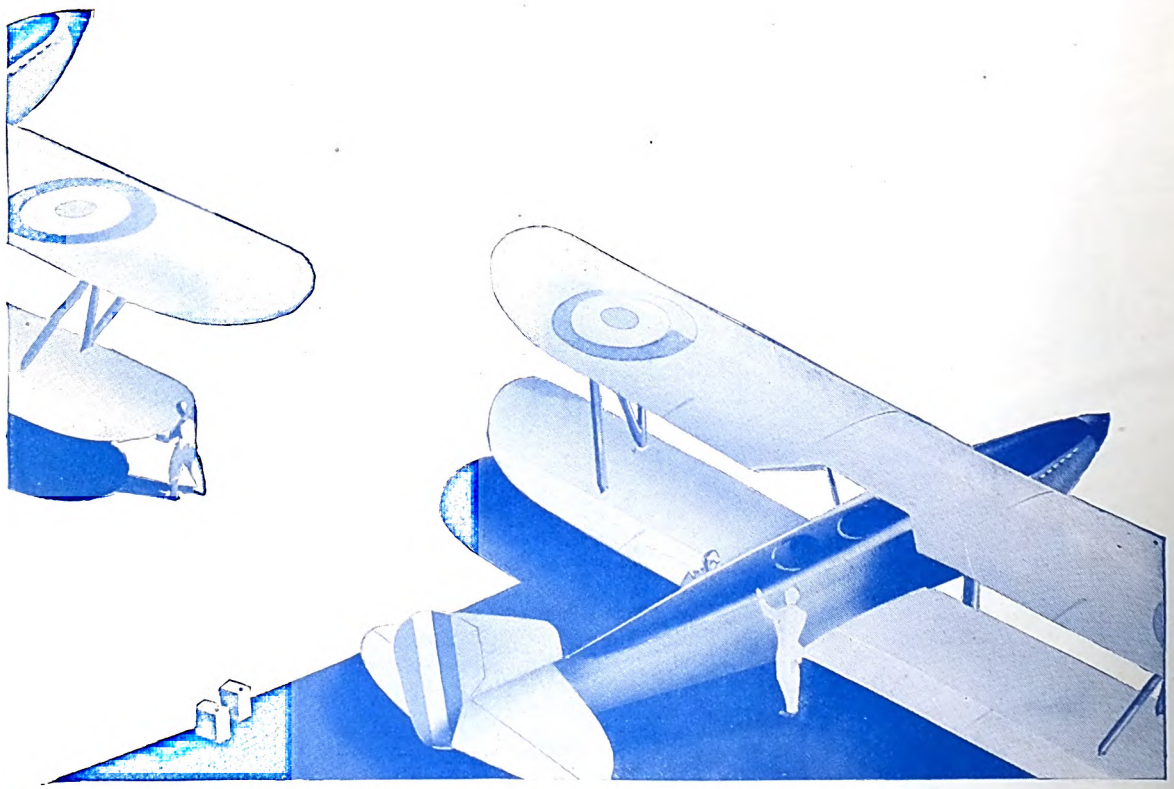

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Incorporating

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VOL. XXXVIII No. 20.

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ON THE GROWTH OF AIRMINDEDNESS.

One of the most encouraging signs for those who are concerned in, with, or for Aviation in general and British Aviation in particular is the fact that whatever paper one opens of a morning in these days, one is bound to find quite a number of paragraphs relating to one phase or another of flying.

There was a time not so many years ago when the only aviation news which found a place in the ordinary newspaper was an aeroplane accident of some kind, fatal if possible. In these days, the tendency of the cheaper newspapers is rather towards what has come to be called heart-interest rather than fatal interest.

No popular actress of to-day can consider her life to be really full unless she has appeared in several paragraphs relating to aeroplanes and has, at any rate, posed in front of an aeroplane, if not actually in one. And a tiny tot who has flown from somewhere to somewhere else and is not frightened because she was holding her daddy's hand may be assured of a longer paragraph in most of the papers than is given to a fatal accident in the R.A.F.

Of course a fatal accident on an adequate scale in any line of business must always have a fascination for Fleet Street. When, in the course of a recent big race at Brooklands, two cars unfortunately collided and two people were killed and several others were more or less seriously injured, the event was given an enormous amount of publicity on that account. One paper even went so far as to announce in large type that the race ought to have been abandoned. This suggestion was obviously foolish because if such accidents did not occur once in a while most forms of sport would fail to attract.

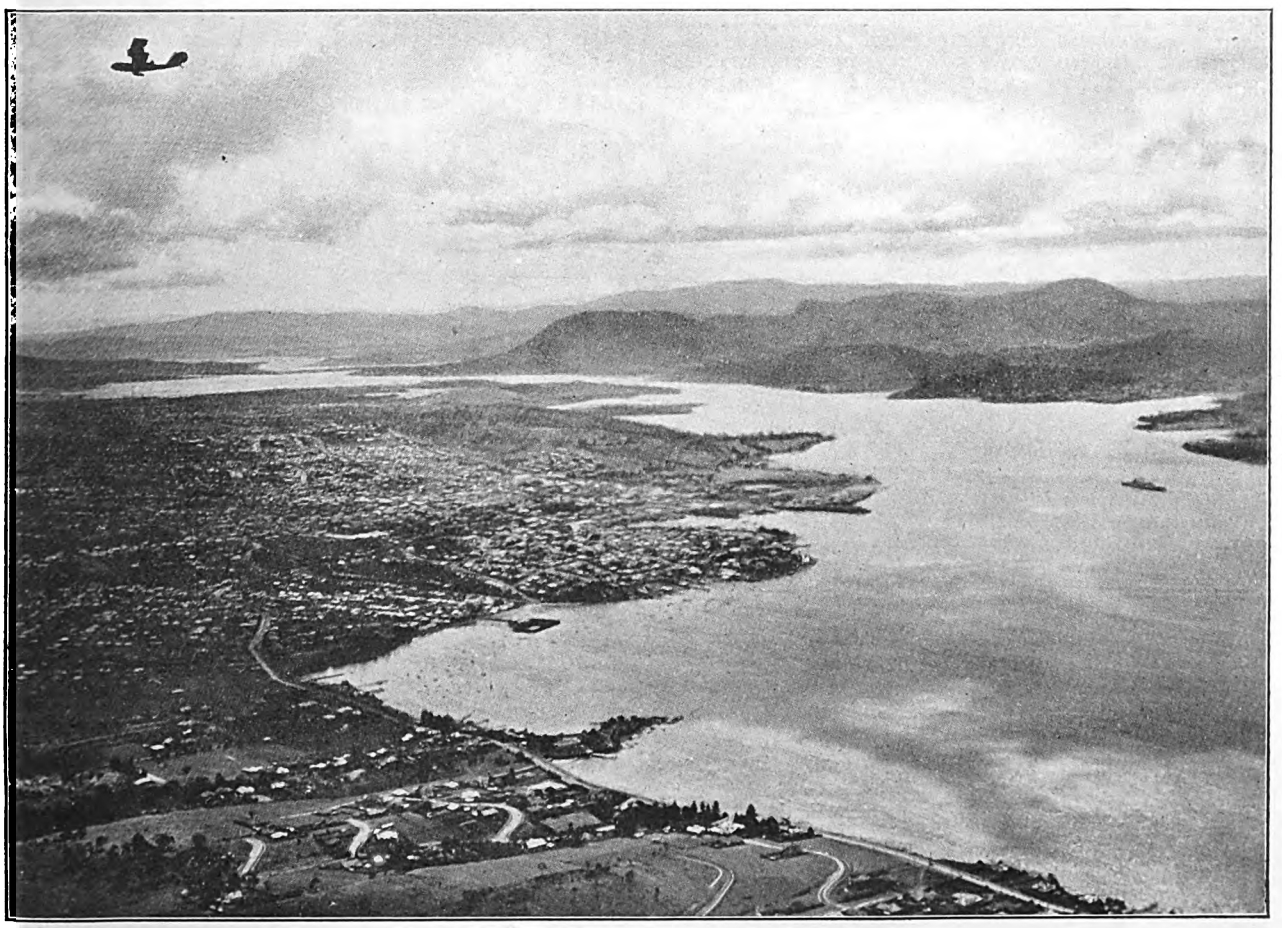
The old argument of the somewhat cynically-minded pioneers of aviation that people only came to see flying in the hope that somebody would be killed was not wholly justified. But the fact is that people do go to see flying and to see motor-racing because they think they are watching men and women go as nearly as possible to killing themselves without actually being killed.

The Essence of the News.

Leaving out of the question all the pure bunk, as our American cousins would call it, of heart-interest and personal publicity and so forth, the fact remains that flying is now so much an ordinary means of conveyance, or is so much part and parcel of any respectable war-like operation, that the most interesting and enlightening information about flying is very often stowed away in articles or paragraphs which in themselves have nothing to indicate that they have to do with flying at all.

For example, take one issue of the World's greatest newspaper, *The Times*, of a week ago, dated Wednesday, May 7. The most important article therein apart from the editorial leading article, concerned the recent visit paid by Lord

"EARNEST FOR LEAVE TO LIVE AND LABOUR WELL." (Kipling—*Hobart.*)



THE CAPITAL CITY.—A Supermarine Seagull (Napier Lion) over Hobart, Tasmania. The machine is one used by the Royal Australian Air Force or coastal survey.

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Irwin, the Viceroy of India, to various hill tribes on the North-West Frontier. The third heading of the article was "By Air to Wana," but the main interest of the article was political and to a certain extent ethnological, in that it dealt with certain characteristics of the various hill tribes which Lord Irwin visited. To us the chief interest is that the journey which was made by the Viceroy and Lady Irwin, could not have been made without Air Force transport.

Quite near the beginning of the article, the author, a correspondent of *The Times* at Simla, remarks, "Unseasonable cold, torrential rain, adverse weather reports, and tales of sodden aerodromes made the odds seem long against the fulfilment of the arduous programme which had been drawn up."—Here, without any preliminary talk or surprise about the idea of the King's Representative in the Indian Empire risking his life by air, you have the simple assumption that wet aerodromes were going to interfere somewhat with the Viceregal programme.

After driving up into the hills on the first day, Lord Irwin and his staff paid a visit to Waziristan by air. The Viceregal party flew in a Hinaidi with an escort of Wapitis. And the writer of the article, referring to the place at which they arrived, remarks casually, "One big frontier post, with aeroplane station attached is somewhat like another."—You will notice that the aeroplane station is accepted as normal equipment. On the third day the Viceroy flew over what has long been the dreaded Mahsud country to Wana and thence back to Peshawar.

On the eighth day of the Viceroy's tour, Lord Irwin flew, accompanied by Lady Irwin, over the famous Malakand Pass to the Swat Valley. One notices that the chieftain of the Swat Valley is now called the Wali of Swat. There was a time when somebody who bore the much more picturesque title of the Arkoond of Swat was celebrated in verse in *Punch* for sheer joy at his beautiful title. By way of compensation, the Wali of Swat seems to rejoice to-day in a kind of local or secondary title by which he is called, the Miangul Gulshahzada—whatever that means.

Which has nothing whatever to do with aviation, but these elegant titles deserve to be recorded if only because we should never have heard of them but for the Viceroy's visit by aeroplane to Swat.

After all that, Lord and Lady Irwin returned comfortably the next day to Peshawar having first of all done a full day's work in receiving local chieftains and conferring orders and commendations on them.

By Comparison.

This description of the tour is one of the finest testimonies to the advantages and comfort and safety of air transport that could be produced. It is in fact more likely to produce air-mindedness among the best people in all nations (because, remember, the best people of all nations do read *The Times*) than was even that magnificent exploit of the Royal Air Force in India, plus re-inforcements from 'Iraq, when they brought Sir Francis Humphrey and some hundreds of assorted men, women, and children of various nations out of Kabul to safety in Peshawar during the Afghan revolution.

That performance showed what aircraft could do in extreme emergencies. The King's Representative in Afghanistan and all those people had the choice between stopping in Kabul with the excellent prospect of being massacred by Amanullah's enemies, or taking the seemingly appalling risk of flying from Kabul over the Pathan hills to safety. Naturally they took the risk of flying, and the Press of the World gave the Air Force full credit for their excellent organisation and their skill in transporting so many people without accident.

But are ordinary readers of *The Times* so likely to be impressed by an extraordinary feat of that kind as they are by reading of the Viceroy's tour over just exactly the same country, when the aeroplanes are not advertised as anything special, but merely enter into the narrative as one of the various methods of transport used?

The best kinds of propaganda are sub-conscious or unconscious. When you start preaching to a man about the possibilities of air transport you immediately rouse his critical sense, if not his definite hostility. But when his daily paper tells him that people are using air transport as a matter of course then he ceases to be either hostile or critical, but merely reads the facts and inwardly digests them without marking or learning them.

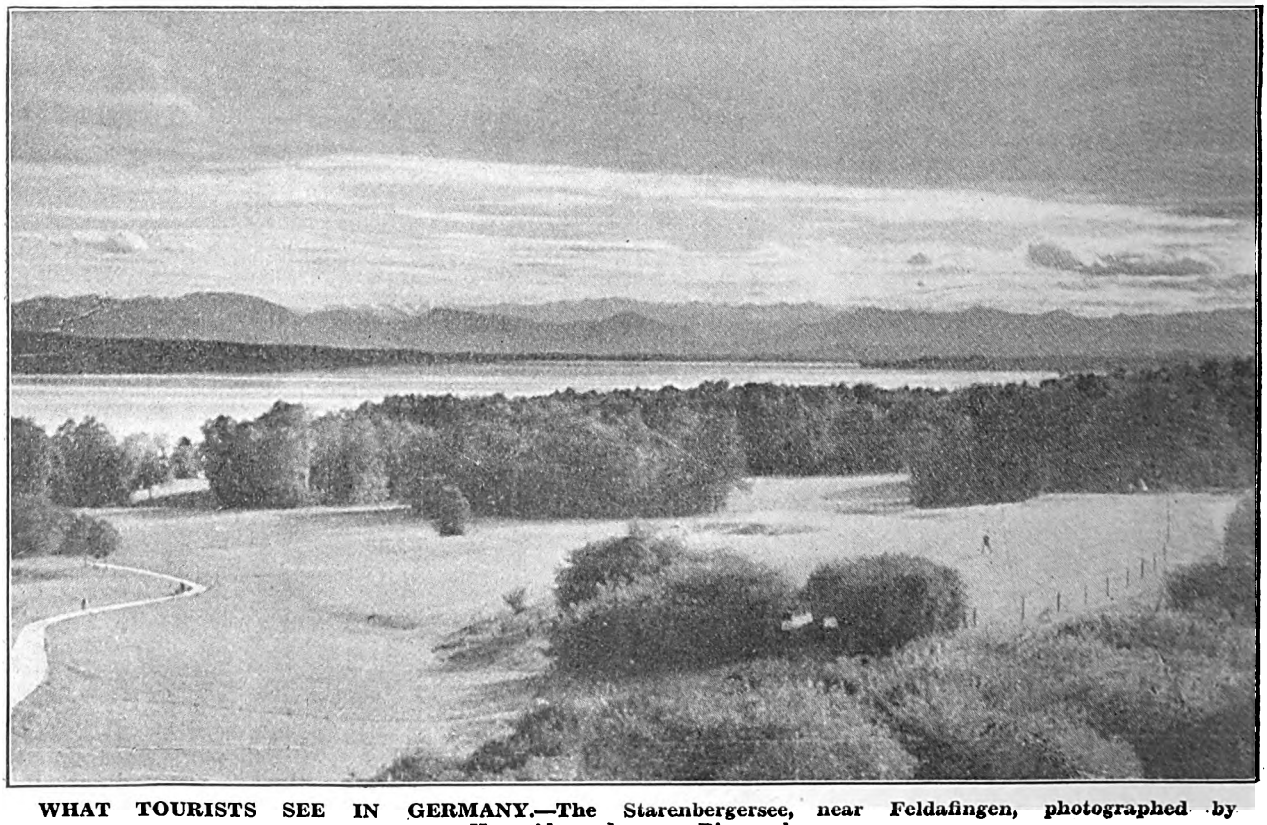
An Out-of-the Way Spot.

On another page of *The Times* of the same date, the leading article under the heading "Imperial and Foreign News" is an extremely interesting account of the recent rebellion in Abyssinia sent by *The Times* correspondent in Addis Ababa. Here we have a piece of history which is not likely to be taught in English schools, though it has a very important bearing on our African possessions.

It tells, frankly, how Ras Tafari comes to be Emperor of Abyssinia. And it tells in detail how Ras Gugsa raised quite a good-looking rebellion last March and was squashed by Ras Tafari's troops.

Quite casually in the course of this article we learn that two French aviators, Messieurs Maillet and Corriger, in the service of the Abyssinian Government, took part in the battle and in addition to dropping bombs kept the Government troops fully informed about the disposition of the rebels.

The report says that the Minister of War, Dejamatch Mulu Geta, who commanded the troops, though entirely unused to aeroplane reconnaissance, profited with great ability by the information thus received.



WHAT TOURISTS SEE IN GERMANY.—The Starenbergersee, near Feldafingen, photographed by Herr Alexander von Bismarck.

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After the defeat of the rebels the news of the Government's vistory was brought from the front by M. Maillet, who was received by the King and decorated with the Collar of Commander of the Order of Menelek.

The Times correspondent at Addis Ababa lays no particular stress on the operations of MM. Maillet and Corriger. He merely mentions them as part of the ordinary machinery of war. THE AEROPLANE is in communication with M. Maillet and hopes with luck to be able to give some further particulars of this very interesting if somewhat out-of-the-way war.

Here again, we have aircraft taken purely as a matter of course. And again we have that sub-conscious influence brought to bear on all intelligent readers of the news.

SOVIET MOVES.

In the very next column is an equally interesting short article under the heading "Soviet Warships in the Black Sea." It comes from *The Times* correspondent in Turkey, and lays emphasis on Turkish fears of the concentration of a Russian Fleet in the Black Sea.

The article goes on to say that warships which have hitherto been in the Baltic, which presumably means Kronstadt (which probably now has some comic Soviet name, and used to be the port of St. Petersburg, which Soviet people now call Leningrad) have recently been passing by way of the Baltic and the Straits of Dover and the Mediterranean through the Marmora and the Bosphorus into the Black Sea, where the Turks evidently fear a concentration of Russian Naval strength to be used against the Turkish Black Sea ports in case of war.

This article states that a new naval station is being prepared by the Soviet Government at Novorossisk and that the Naval Air Arm of the U.S.S.R. in the Black Sea is also being reorganised. And it states that very shortly Russia will have a much stronger naval force in the Black Sea than any other country.

Those who read THE AEROPLANE intelligently will have noticed that in the recent article on the visit of the *Graf Zeppelin* to this country, and of several of our countrymen in the *Graf Zeppelin* to Lake Constanz, the statement was made that at the Dornier Works on the Swiss side of Lake Constanz our visitors saw a number of Dornier Wals being turned from peaceful flying-boats into war-machines by equipping them with gun-rings and bomb-dropping gear,—and that these Wals were intended for the Soviet Government. The fact that the statement about the re-organisation of the Soviet Naval Air Arm in the Black Sea should have appeared in *The Times* on the very same day that this statement appeared in THE AEROPLANE is rather interesting. It shows the curious way in which vital news gets about the world.

Those who take a proper interest in World Politics, such as should certainly be taken by all officers of the Royal Air Force, will find particular interest in this small piece of news. It is one of the straws which shows the direction in which the wind is blowing.

THE AEROPLANE has already indicated the growing ill-feeling between Turkey and Russia. Although racially the lower classes of Turks are of the same family as the bulk of the population of Russia, they have many political, national and tribal differences. And when the next stage of the great Race War comes along, we shall almost certainly find the Turks on our side, although strictly on racial grounds they ought to be on the Russian side. But, just as in the War 1914-18 not only races but tribes were cut by political lines, so in the next war this may be one of the instances in which a nation may be on the right side politically, if wrong racially.

THE AIR LESSON.

Thus you may see how air-mindedness is creeping into the daily life of all nations in spite of the natural conservatism of humanity. Admittedly all these three pieces of news have to do with aircraft of war of one kind or another. Although the Viceroy's voyage was of a perfectly peaceful nature it was made in war machines. And although the aircraft used in Abyssinia were probably quite peaceful machines originally, they were used for war purposes. The Russo-Turkish news likewise concerned peaceful aircraft converted for purposes of war.

Against these we have the recent news that Mr. Man Mohan Singh and Mr. "Engineer" have flown to India in an attempt to win the prize offered by the Aga Khan for the first Indian to fly either from England to India or from India to England alone. And we had not so long ago, the news that the Vicomte and Vicomtesse de Sibour had flown in a perfectly peaceful Moth, to Addis Ababa, aforementioned, where they had sold their Moth to Ras Tafari, presumably to be used for warlike purposes.

And we have the cheering news that Miss Amy Johnson, the first woman to take a ground engineer's licence, has flown right across Turkey from Constantinople to 'Iraq and has successfully reached Calcutta on her way to Australia.

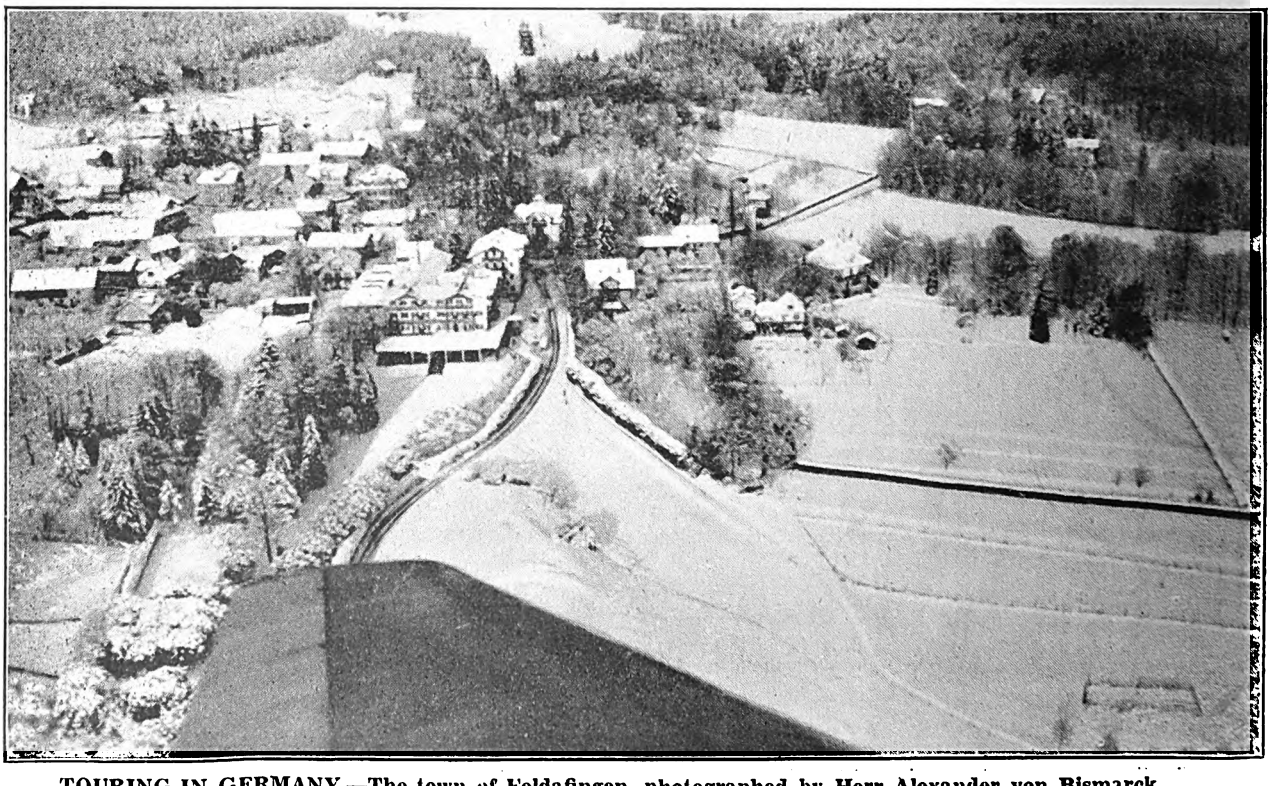
Most of these peaceful efforts have been passed over as ordinary items of news in the papers without any special glaring headline. And they relate to precisely the same areas as the items of news which referred to war machines. All of which is very encouraging.

A CURIOUS CONTRAST.

The psychological aspect of this is particularly interesting because this sub-conscious air-mindedness is increasing despite the fact that deliberate efforts to create air-mindedness seem to meet with so little success.

For example, on that same day, Wednesday, May 7, when these things appeared in *The Times*, the Air League of the British Empire held a Dinner and Dance to celebrate its 21st Birthday. It was a very good party and a number of people of considerable importance were there.

One of the Vice-Presidents of the League, who was the Chairman of the evening, was Sir Alan Anderson, a leading figure in Shipping and Finance in this country. One of the speakers of the evening, was Sir Samuel Hoare, our late Secretary of State, and another was Squadron-Leader



TOURING IN GERMANY.—The town of Feldafingen, photographed by Herr Alexander von Bismarck.

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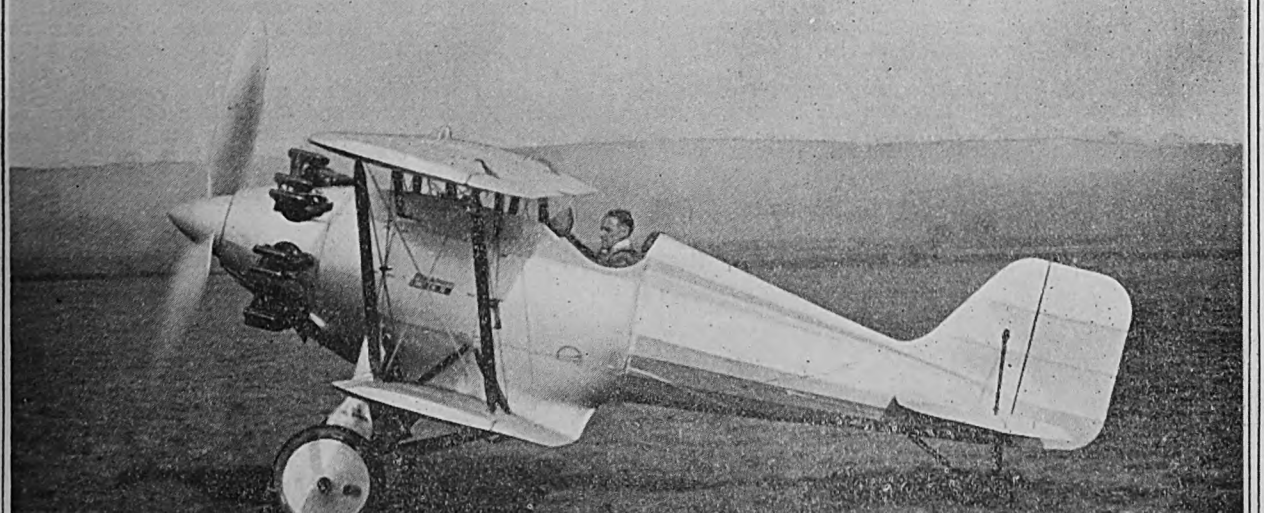

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the Hon. F. E. Guest, formerly Under-Secretary of State for Air. Lieutenant-Colonel Moore-Brabazon, lately a Parliamentary Secretary for one or other of the Government Departments, also spoke, as did Mr. P. J. Hannon, a Member of present Parliament.

They all spoke well, as may be judged by the report of the Dinner which appears elsewhere. And yet, so far as one has been able to discover, practically nothing of their words of wisdom and of warning was reported in any of the papers next day. One paper did report a few words said by Sir Samuel Hoare, but the function as a whole was ignored.

This may have been because on the same evening the Newspaper Press Fund was holding a Banquet at which His Royal Highness the Duke of York was the guest of the evening. And consequently the newspapers may have been so concerned with the welfare of their superannuated colleagues they had no room in which to deal with Air-Mindedness as such. Or the omission may have been due to the fact that the Air League omitted to ask the newspapers to send to their party individual representatives who were of great enough importance to ensure that what they wrote should be duly published. Anyhow, the fact remains that what ought to have been a really important date in the History of British Aviation, was completly neglected by the Press which makes such a shout about its own patriotism, and Empire Free Trade, and such things.

One doubts whether in any other country there is an organisation formed twenty-one years ago for the express purpose of impressing on its own particular nation the vast importance of adequate air defence. Certainly our Royal Aeronautical Society is the oldest scientific aeronautical organisation in the World, and one believes that the Air League is the oldest propagandist air organisation in the World. That being so, our papers, or at any rate those which have been during the past few years crying out most loudly about our imminent danger of invasion by air, might at least have laid emphasis on the fact that we have a body which for twenty-one years has been doing its best to impress on the people of this country the need for air defence, which these same papers have themselves on occasions made the subject of impassioned articles.

The Air League.

The Air League has of late been doing very good work. At the Aero Show at Olympia, in July last, it organised lectures and invented many ingenious methods of impressing itself on the British public. Probably if the organisers of the Exhibition had had a little more understanding of the British Public more members of the said Public might have visited Olympia to be impressed. But certainly the Air League did its part to the best of its opportunities.

More recently at the annual Schoolboys' Exhibition the Air League laid itself out for ten full days to impress on the youth of the nation the importance of aviation in all its stages. And judging by what was to be seen on the spot, it met with well-deserved success.

The methods of the Air League have changed considerably of late. Instead of attacking the Air Ministry in its own monthly organ the Air League has been publishing interesting information such as is likely to interest people of all sorts in flying. Given time to reorganise itself it will no doubt follow the same policy as was followed by the Navy League in its great days, when the late Robert Yerburgh and Mr. Pat Hannon made it a really great political power.

In those days the Navy League frequently abused the Treasury for not producing enough money for the enlargement of the British Navy, but it had one fixed policy which was that anything the Admiralty did was right, simply because the Admiralty did it. In that way, the Navy League impressed on all its members, and through them impressed on the majority of the people in this country, the fact that we had the finest Navy in the World, and that it was handled by the best possible people, and that it deserved the whole-hearted support of the nation.

That is precisely the kind of policy which the Air League should follow. Briefly, its policy should be "The Air Ministry, right or wrong." If it wants to criticise the Air Ministry at all it can do so privately behind the scenes. But in public its one aim and object should be to tell everybody how right the Air Ministry is on every possible subject. And on this line of argument it can then pursuade the nation that the Air Ministry deserves the nation's support.

Policy.

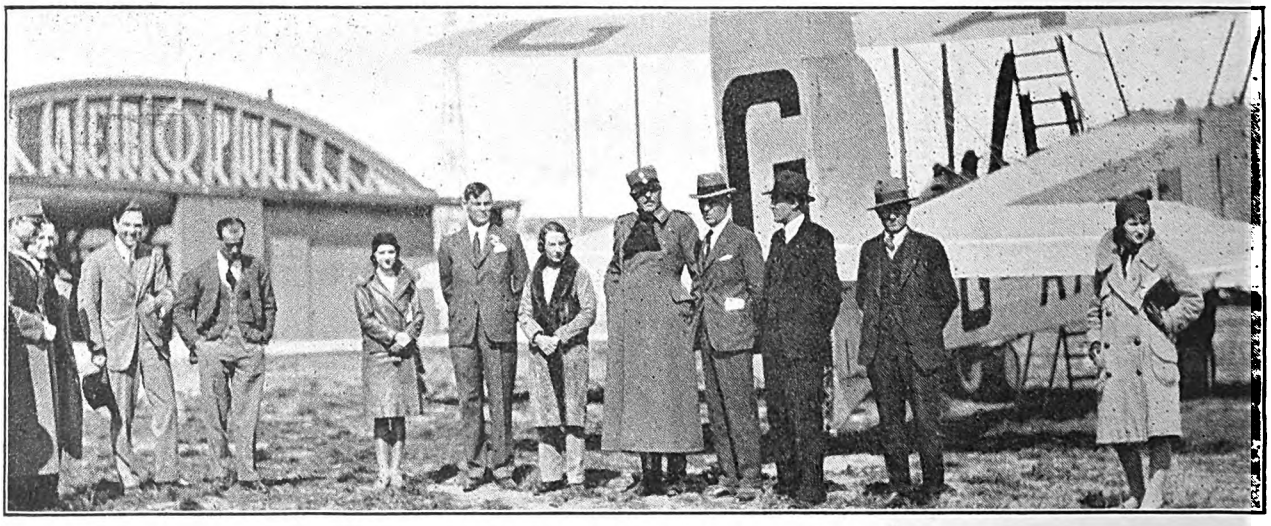
Minister after Minister in the House of Commons has informed the House in answer to questions that the Government has no intention of bringing up again the question of whether the Air Ministry should cease to exist so that the Air Force may be divided between the Navy and the Army. Conservative Governments, Liberal Governments and Socialist Governments have all given the same answer. But there is always a possibility of the old agitation rising again, and anything which can strengthen the hand of critics of the Air Ministry should be avoided. All our endeavours should be directed towards backing up the Air Ministry itself.

What the Air League needs at the moment is undoubtedly a thoroughly active President who carries a great deal of weight politically, without himself being a politician. The Duke of Sutherland, as President, in the past has done very good work. Everywhere he has been popular, especially in the United States, where, when at a great banquet speaker after speaker addressed him as "Your Royal Highness" he never flinched, and courteously refrained from correcting the error in public. But he has too many calls on his time to be able to devote himself altogether to the interests of the Air League.

The difficulty is to find a man of equally high standing in the eyes of the people of this country who can devote himself to the work of the Air Ministry.

Somebody the other day suggested Lord Derby. He would be excellent, but he probably has far too many other interests outside of aviation. Another suggested Lord Trenchard. There could not possibly be a better man for the job, for nobody knows as much about aviation as he does and nobody has such extraordinary foresight. But one doubts whether he could be induced to come so much into the limelight as the President of the Air League should be.

If anybody has any other suggestion to make, one feels sure that the Chairman and Committee of the Air League would be glad to have them. In any case, the Air League now has its great opportunity. The idea of air transport is soaking into the minds of the people and anybody who will get up and talk air sensibly—not hot air—is bound to receive attention.—C. G. G.



IN JUGO-SLAVIA.—Mr. and Mrs. Alan Butler, of the Aircraft Operating Co. Ltd., and the Gloster Survey Biplane (Jupiter engines) on the aerodrome at Beograd (Belgrade). In the middle of the group is the Chief of Staff of the Jugo-Slav Army. Next to him is Mrs. Butler, then Mr. Pearse (who, with Mr. Mapplebeck, runs the De Havilland agency in Yugo-Slavia), next come Mrs. Pearse, Mr. Butler, and Mr. T. G. Mapplebeck.

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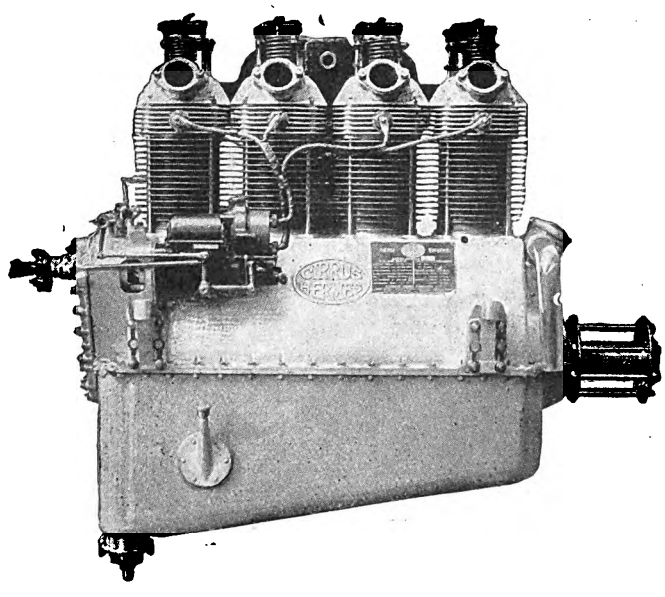

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THE AIR LEAGUE'S COMING-OF-AGE CELEBRATION.

The Coming-of-Age Celebration of the Air League of the British Empire took the form of a Dinner and Dance at the May Fair Hotel on May 7. Sir Alan Anderson, K.B.E., Vice-President of the Air League, was in the Chair.

It was far the best party the Air League has ever done, and was free from those catch-penny tricks and cheap attempts to get publicity which have disfigured Air League affairs in the past, and have kept the best people away from it. The Committee and Secretary deserve to be congratulated.

After the Loyal Toasts had been proposed by the Chairman and duly honoured, Sir Alan Anderson explained that the Duchess of Bedford had an appointment to broadcast from the B.B.C. Studio and would have to leave the assembly. He therefore proposed her health and that of her crew, Capt. C. D. Barnard and Mr. R. Little, who had just completed a magnificent and record-breaking flight to the Cape and back.

Lieut.-Col. Thwaites, C.B.E., M.V.O., M.C. (Secretary of the Air League), then read letters and telegrams regretting their inability to be present from Mr. Montague (Under-Secretary of State for Air), Marshal of the R.A.F. the Lord Trenchard, the Lord Thomson (Secretary of State for Air), Air Chief Marshal Sir John Salmond (Chief of the Air Staff), and others.

SIR ALAN ANDERSON, K.B.E., proposing the toast of British Aviation coupled with the name of the Air League of the British Empire, said that the League's sole surviving founder-member was with them to-night in the person of Sir Reginald Cave-Browne-Cave. Several members dating from 1909 were present including Major-General Seely and the Hon. Lady Shelley-Rolls. He said that while they were dining a young woman of 22, the only woman to hold a ground-engineer's licence, for which she had qualified while she was acting as a typist for the Air League, was now flying alone to Australia. He proposed that the assembly should send her a telegram reading, "The Air League at the Annual Dinner admire your pluck and enterprise and send best wishes for the success of your truly British flight." In response to shouted suggestions from one of the tables the words "on your good British machine" were added.

The speaker then referred to the position of Aviation twenty-one years before when M. Blériot and the Hon. Charles Rolls had flown the Channel and Henry Farman kept in the air for three hours. The endurance record now was 65 hours and with re-fuelling, 17 days. The height record was then 1,500 feet and it was now 40,000 feet.

Great Britain was now leading the world in technical achievement and the practice of flying. We had been first across the Atlantic and had won the Schneider Trophy twice in succession. He was not impressed with countries which started air-lines for which the taxpayers had to pay and he hoped and believed that our air transport would pay its own way.

The Air League was pleased with the Government for the first time because it had not cut down the Civil Aviation Vote in the Air Estimates. He then outlined the progress of transport throughout the ages and ended by appealing to his hearers to join the Air League.

THE RT. HON. SIR SAMUEL HOARE, P.C., G.B.E., C.M.G., LL.D., supporting the Toast, said that when the Air League was started the Brothers Wright had offered their machine to the British Government three times and it had been refused twice by the War Office and once by the Admiralty. This was a common incident in the history of Whitehall. Whatever Government was in office the habit of Government Departments was always to say no to enterprise and adventure. [Here, for almost the first time, one disagrees from Sir Samuel. The War Office and the Admiralty were right. Within three years the Wright aeroplane was dead. And we had British and French aeroplanes which were far superior to it.—C. G. G.]

During the five or six years that he had been connected with one of the Departments of Whitehall the Air League had thought, and he himself had agreed, that he did not go far enough. Being on the political dole he could now speak his mind and he agreed to a great extent with the criticisms of the Air League.

The assembled company were there to look back on twenty-one years and forward to twenty-one years of the air possibilities of the British Empire. When he first went to the Air Ministry in 1922 Mr. Bonar Law had told him that it was possible that they would have to abolish the Air Ministry during the next two months and they would probably have to divide up the Air Force between the Navy and the Army. They would also probably have to abolish subsidies to Civil Aviation. In fact it had not been a very optimistic atmosphere.

However, thanks to the enterprise and spirit of adventure of British pilots, the enterprise of British Industry and the help of British science, the position of British Aviation to-day was very different from that in 1922.

Speaking of twenty-one years ago, he said that Col. Moore-Brabazon, in a machine designed and built by Mr. Horace Short, had just flown a circular mile at Sheerness. He would like to hear Colonel Moore-Brabazon compare that first circular mile with his record time on the Cresta run. We had the finest Air Force in the world, but civil flying in this country did not compare favourably with the civil aviation in other countries except that it was safer and more reliable. The French Minister of Air had recently pointed to British Civil Air Transport as the safest in the world and had supported his words by undertaking a journey to North Africa in a British machine, a Short Calcutta.

Although we might regard with satisfaction the achievements of the last twenty-one years we must not rest content. Our Air Force was only fourth in point of numbers and we must not be content until we saw parity between the British Air Force and those of the other great powers. Our civil machines were the safest and most punctual and regular in any part of the Globe but there were not enough of them.

He would like to see a fuller use of Air Power in the province of Imperial Defence. He did not want to see the other Services reduced beyond the safety line but he thought that fuller use could be made of Air Power in the Empire. An impartial inquiry would find that Air Power could maintain efficient Imperial Defence at a smaller price. British taxpayers should take an interest in the possibility of British Air Power undertaking fuller duties at a lower cost in money and life.

LIEUT.-COLONEL MOORE-BRABAZON, M.C., responding to the Toast, pointed out that they were having not only a dinner but a dance and the previous speaker's reference to his age would prevent him getting a young partner. He enjoyed listening to ex-Secretaries of State for Air because of the differences between their policies in and out of office. He was an aerial die-hard but he did not wish that there should be any misconception of the dangers to early pioneers because they never got off the ground. The Air League, like all good aircraft, had its ups and downs. Coming-of-age, in addition to becoming liable to receive bookmakers' circulars, usually meant having presents and the Air League needed another £5,000 a year.

There were four lines of attack by which people could be persuaded to join the Air League. First was the threat of being bombed and gassed; secondly there was the necessity of supporting a British Industry; thirdly there was the sporting side of it; and fourthly, there was the question of Imperial Defence.

MR. P. J. H. HANNON, M.P., F.R.G.S., supporting the response, said that they were celebrating the twenty-first anniversary of a great national organisation. The Air League had to carry its message all over the world, and needed practical support.

SQ. LDR. THE RT. HON. F. E. GUEST, P.C., C.B.E., D.S.O., proposing the Guests, said that if the Air League was to do its best work, its policy must be clearly defined. It should have a military and a civil policy. The Royal Air Force was all right but the position of British civil aviation to-day was pathetic and contemptible.

MAJOR-GEN. THE RT. HON. J. E. B. SEELY, P.C., C.B., C.M.G., D.S.O., responding for the Guests, said that he was one of the aborigines, and had been the first Minister in any country to fly. He believed that there were actually no guests there but that all were members, because in the reception room there had been a dog asking for subscriptions from non-members and none had been received.

Constant effort was needed to make the people of this country understand that England would depend for her future existence on her Air Force and on Civil aviation. The Air League had helped to make England the great Air Power that she now was.

COLONEL THE MASTER OF SEMPILL, A.F.C., proposing the Chairman, said that Sir Alan Anderson was one of the biggest figures in the world of finance and shipping, which he regarded as a favourable sign for the future.—C. M. MCA.

[Sir Alan Anderson has to do with the Orient Line, which supplied the good ship *Orford* as a floating hotel for the Royal Aero Club for the Schneider Trophy Contest. One hopes that his constant contact with the Marine Mind will not make him unduly slow in doing something practical for the development of Aviation.—say something after the manner of the Hamburg-America and other foreign steamship firms.—C. G. G.]

IMPORTANT DATES.

May 15.—Dinner to Lord Wakefield by the R.Ae.S., the R.Ae.C., the S.B.A.C., and the Air League.

May 17.—Brooklands Flying Display and opening of Brooklands Aero Club.

May 24.—Aerial Cross-Country Observation Competition of Norfolk and Norwich Aero Club.

May 29—June 14.—Royal Tournament at Olympia.

May 30.—Wilbur Wright Memorial Lecture by Mr. H. R. Ricardo.

May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support).

June 3.—R.A.F. Middle East Dinner.

June 7.—N.F.S. Meeting at Reading.

June 9.—Northamptonshire Aero Club's Meeting at Sywell.

June 10—15.—F.A.I. Conference, Paris.

June 14.—Manston Garden Party.

June 19.—N.F.S. Meeting at Nottingham.

June 21.—Annual Air Rallye at Haldon Aerodrome.

June 21.—Competition for the Gywnn Maddocks Cup at Heston.

June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.

June 27.—Annual Dinner, R.A.F. Dinner Club.

June 28.—Royal Air Force Display at Hendon.

July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).

July 9—12.—R.A.F. Athletic Championships at Uxbridge.

July 13.—N.F.S. Meeting at Leeds.

July 19.—N.F.S. Meeting at Hull.

July 20—Aug. 7.—International Touring Competition, starting from Berlin.

July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).

Sept. 1—6.—International Congress on Air Navigation at the Hague.

Sept. 6—28.—International Aero Exhibition at Stockholm.

Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).

Sept. 27.—Air Pageant at Hanworth.

Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

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A FINE PERFORMANCE.

Miss Amy Johnson, a gallant young woman of Yorkshire, and the London Aeroplane Club, has made a sterling showing to date in her attempted flight to Australia. Incidentally she was two days ahead of Mr. Bert Hinkler's time at Karachi, where she arrived on May 10, and that would have been remarkable even had she got no further.

At starting Miss Johnson stated that she hardly expected to beat any records although she hoped to put up a good show, which is a becoming and laudable ambition for which she will carry more good wishes than if she had, as stated in the daily press, deliberately published her intention of outdoing a pilot of Mr. Hinkler's standing.

Miss Johnson flew from Croydon to Vienna on Monday, May 5, and from Vienna to Constantinople the following day. Except for bad rainstorms over the Balkan mountains she reported good flying practically all the way.

Her start on May 7 was delayed slightly by unspecified repairs to the airscrew, and instead of reaching Ramadi Miss Johnson came down at Aleppo after having very poor visibility through the Taurus mountains, and some difficulty with her heavily-loaded machine.

Between Aleppo and Baghdad next day she met a violent sandstorm, and had to land after struggling against it for some time. Her two hours in the desert beside the machine, which showed signs of wanting to blow away every moment, were a nasty experience. Miss Johnson piled tool-boxes, and luggage round the wheels for chocks and attempted to cover the engine to keep some of the sand out. She started again as soon as practicable, and had some difficulty in finding Baghdad owing to the weather, but arrived there safely.

On Friday the flight was continued to Bandar Abbas, and on Saturday to Karachi which she left at dawn on Sunday for Allahabad and Calcutta.

On Monday she reached Calcutta, after having to land at Jhansi for fuel.

On Tuesday morning she left Calcutta in an attempt to fly non-stop to Rangoon.

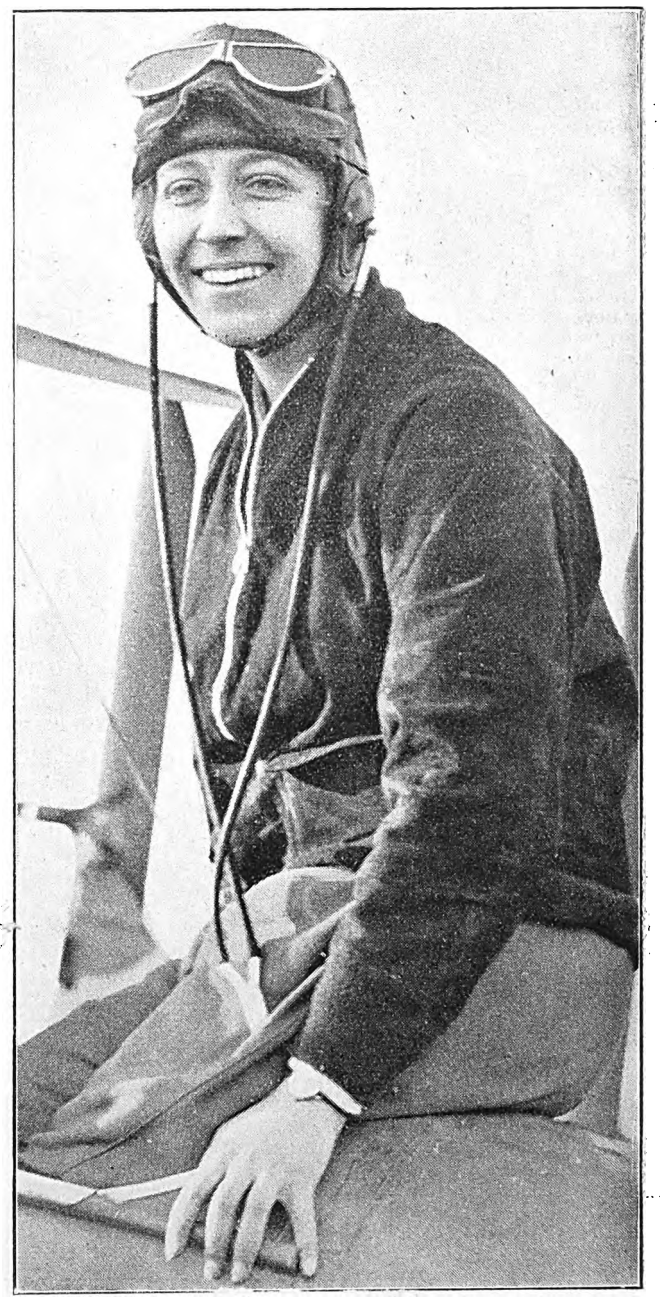
Miss Johnson has a faster machine and better landings and facilities en route than Mr. Hinkler had in 1928, but the fact that she is, to date, three days in advance of his time, is an amazing feat which entitles her to the profound admiration of everyone in the game. Her success is no doubt due very largely to the fact that she is her own engineer as well as a capable pilot.

Lord Thomson, Secretary of State for Air, has sent the following telegram to Mis Amy Johnson:—

I congratulate you heartily on reaching India by light aeroplane in the record time of 6 days, and trust you will have equal success in the remaining stages of your flight to Australia.

Miss Margaret Bondfield, Minister of Labour, has also sent, through the Air Ministry, a message to Miss Johnson:—

Warmest congratulations on your splendid effort, and all good wishes for your future success.



Miss Amy Johnson.

THE WILBUR WRIGHT MEMORIAL LECTURE.

An event of outstanding importance to the Aeronautical Community and of particular interest to those interested in aero-engines will take place on May 30, at 18.30 hrs., when Mr. H. R. Ricardo, A.M.Inst.C.E., M.I.A.E., F.R.Ae.S., will deliver the 18th Wilbur Wright Memorial Lecture before the Royal Aeronautical Society, at 18, John Street, Adelphi, W.C.2.

Mr. Ricardo will read a paper on "The Development and Progress of Aircraft Engines," in which he will review progress and then indicate possible lines of development.

This Memorial Lecture, which was founded in honour of the late Wilbur Wright, is the most important in the calendar of the Society, and as such rightly attracts a great deal of attention.

A lecture of this kind from an engineer of Mr. Ricardo's standing, who has the advantage of being an acknowledged specialist without any particular interests, is bound to be full of the most enlightening remarks.

The recent work of Mr. Ricardo on Diesel Engines should add even further interest to this paper, for the question of compression-ignition engines and the burning of heavy fuels is very much to the fore.

People are reminded that there is no excuse for missing an occasion like this, which is quite open to anyone interested. There is merely a book to be signed in the hall. The Royal Aeronautical Society is delighted to welcome strangers,—distinguished or otherwise.—T. J.

ROYAL PASSENGERS.—The King and Queen of Siam alighting from a Fokker monoplane of the K.N.I.L.M.

EUROPE'S FIRST AIR POLICE.

Aerial police are now enforcing the aerial privacy of the fortified regions of the Moselle Department, except along an official corridor which follows the Saar valley. Commercial and private machines which violate the prohibited area are reported by ground stations, and military aeroplanes from Thornville or Metz or both are set on the trail. A commermercial machine of the Farman Air Line is reported to have made a compulsory landing after such a trespass.

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THE INTERNATIONAL AVIATION LIGHTING MEETING IN BERLIN.

BY W. S. STILES, PH.D.

Perhaps at the present time there is no need to emphasise the importance of night flying, but the following figures are significant. In the United States there are about 60,000 kms. of airway in operation, of which some 16,000 kms. are equipped with lighting arrangements for night flying. In France 2,500 kms. out of 4,500 kms. are so equipped. Germany has over 1,000 kms. of lighted airway, Belgium 110 kms., and Great Britain none.

There seems little doubt that as time goes on all principal airways will work day and night services, and the air traveller of the future will be as little concerned whether he journeys by night or by day, as is the railway traveller of the present time. It must, however, be realised from the start that the successful development of night flying for commercial purposes depends in great measure on the adequate lighting of airways, aerodromes and aircraft.

The term "lighting" is used here in a very comprehensive sense. Aviation lighting equipment comprises, to begin with, the powerful light beacons (airway beacons) placed at intervals along an airway to mark the route. These are usually flashing beacons, and their distance apart varies considerably in different countries. In the U.S.A., for example, 16 kms. is the common spacing, and in France 70 kms., or even greater, spacings are used.

Some airways are equipped with smaller beacons (intermediate airway beacons) placed in between the airway beacons at a spacing of from 5 to 10 kms. Neon tubes have been used for this purpose.

At an aerodrome the lighting system may include a specially powerful beacon (location beacon) to mark the position of the aerodrome, boundary lights to show the pilot the safe limits of the landing area, a landing flood-light which illuminates the surface of the field, an illuminated wind-indicator, obstruction lights, and a ceiling height projector, besides subsidiary lights necessary for the regulation of the air traffic.

On the machines themselves there may be, in addition to the navigation lights, one or more floodlights for illuminating the ground when landing.

The design and construction of lighting equipment to serve all these purposes amounts practically to a new branch of illuminating engineering. Granted that the technical difficulties of aviation lighting can be, and in fact are being, overcome there still remains one further condition to be satisfied before night flying has a clear road for progress. It is essential to have internationally standard systems of aviation lighting.

A pilot of the future, taking a machine from London to Baghdad, say, must be assured that the light signals he observes will be of the same character and will mean the same thing whether he is flying over England, or Austria, or Persia. He must be assured that the aerodromes on which he may have to alight will be adequately lighted and in accordance with a recognised system.

The International Commission on Illumination, a body formed to foster interest in all branches of illumination, particularly with a view to obtaining international agreement on fundamental questions, turned its attention to aviation lighting in 1928 and appointed a special technical committee to deal with the subject. The next meeting of the Commission will take place in Great Britain in 1931, but the rapidity with which airways are being equipped with lighting installations has made it imperative for the Commission to hold without delay a sectional meeting of representatives of the different air lines, lighting experts, manufacturers of lighting fittings, etc., for an open discussion of aviation lighting problems.

On April 28, in the *Technische Hochschule*, Berlin, the First International Conference on Aviation Lighting was opened and set to work immediately to draw up provisional recommendations for the international standardisation of aviation lighting.

Among the delegates to the meeting were representatives of twelve European countries, of Japan, and an observer from the U.S.A. In all some 90 delegates were present.

AIRWAY AND AERODROME LIGHTING.

Anyone who has had to correspond abroad on technical matters will realise the importance of the first task tackled by the Conference—the settling of equivalent expressions in English, French, and German for the principal technical terms used in aviation lighting.

The following list was accepted provisionally:—

Phare	Beacon	Leuchtfeuer
Projecteur ...	Projector	Scheinwerfer
Feux de position	Navigation lights	Stellungslichter
Phare de ligne ...	Airway beacon ...	Flugstreckenfeuer
Phare de terrain...	Location beacon...	Ansteuerungsfeuer
Balisage de ligne	Airway lighting...	Flugstreckenbefeuerung
Feux d'obstacles	Obstruction lights	Hindernisfeuer
Projecteur ou batterie d'atterrissage	Landing flood-light or battery of floodlights	Landebahnleuchte
Feux d'atterrissage	Landing direction lights	Landebahnfeuer
Feux de délimitation de terrain	Boundary lights ...	Umrandungsfeuer
Indicateur de vent éclairé	Illuminated wind-indicator	Beleuchteter Windanzeiger
Phare à éclat ...	Flashing light	Blinkfeuer
Phare à éclipse ...	Occulting light ...	Unterbrochenesfeuer
Phare principal ...	Principal airway beacon	Hauptfeuer
Phare intermédiaire	Intermediate airway beacon	Zwischenfeuer
Feux auxiliaires...	Auxiliary lights ...	Zusatzfeuer

The Conference then attacked the main problem. In general terms this amounts to the following:—On the one hand, the characteristics and arrangement of all the different lights must be so chosen that each performs effectively its own particular job; on the other hand (a), the number of simple characteristics of lights which are available is limited, particularly for long-range lights (two or

THE STAR-SPANGLED MANNER.—A Puss-Moth (otherwise Moth III) with inverted Gipsy engine, on floats on the Welsh Harp, photographed in bright sunlight to give a moonlight effect.—(*"Aeroplane" photograph.*)

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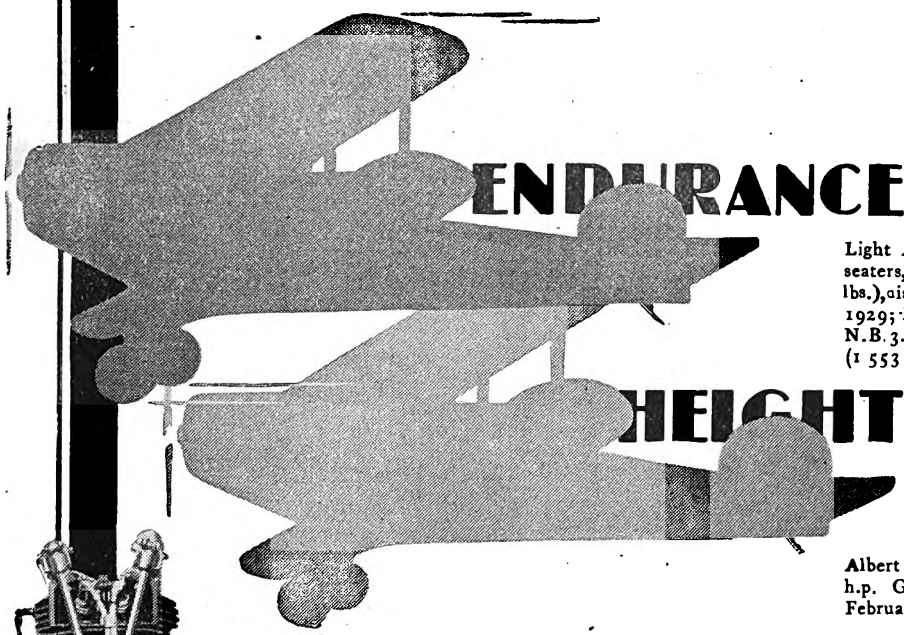
2 WORLD'S RECORDS

OF THE ARMSTRONG SIDDELEY GENET

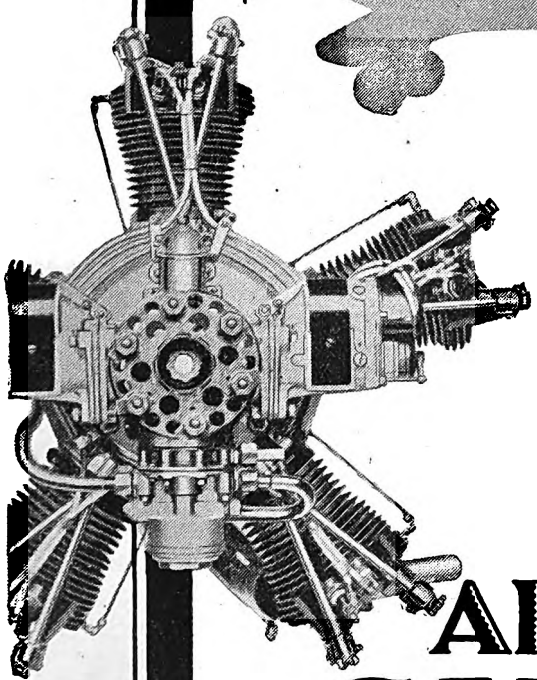


ENDURANCE RECORD

Light Aeroplanes, 3rd category, single seaters, weight 200-350 kgs. (440 770 lbs.), distance in a straight line, July 17th, 1929; D S. Zimmerly, Barling, U.S.A., N.B.3. 80-88 h.p. Genet, 2,500 kms. (1 553 miles).

HEIGHT RECORD

Light aircraft, 3rd category (single seaters weighing less than 350 kgs.), Altitude (France). Albert monoplane fitted with 80-88 h.p. Genet engine at Le Bourget, February 11th, 1930, 7,730 metres.



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use of both principal and intermediate airway beacons, each principal beacon marking an emergency landing-ground. This matter was referred back for further consideration when more experience of the two systems had been obtained.

LIGHTING ON AIRCRAFT.

The matters considered under this heading were the following:—The range, colour and light distribution of navigation lights, the standardisation of the voltages used on aeroplanes, the standardisation of lamp-caps and sockets, and the use of landing floodlights mounted on the machine.

For the navigation lights a light distribution has been suggested, with the maximum intensity in the direction of flight, the intensity to the side and the intensity vertically upwards or vertically downwards being not less than 50% of the maximum intensity.

On the difficult question of voltage so many factors come in—weight of storage-batteries, weight of cable system, danger of an arc forming if a current-carrying wire is broken, use of the electric supply for purpose other than lighting, etc,—that it is not surprising that the Conference was unable to agree on one voltage as being the most suitable. It was proposed to recognise the voltages 12 and 24.

The desirability of all machines employing the same type of lamp-cap and holder so that spares will be easily obtainable anywhere is obvious, and work on the development of suitable light lamp-sockets was initiated.

In conclusion I think it may be said that the Conference has accomplished more than one had the right to expect in so new a subject as aviation lighting. The recommendations agreed to by the meeting represent only a part of the work done. These recommendations are only provisional and must be submitted to the plenary session of the International Commission on Illumination in 1931 for ratification or amendment.

In the meantime the discussions at the present Conference will assist Delegates to employ their endeavours in directions most likely to lead to satisfactory and consistent aviation lighting.

AN OPPORTUNITY.

In connection with an Air Pageant which is to be held in Glasgow on Saturday, May 24, Imperial Airways Ltd. have arranged a special long week-end flying service. One of their three-engined Armstrong Argosies (three Jaguar engines) will fly north from Croydon on Friday, May 23, and return from Glasgow on the following Tuesday.

Cars will leave Airways House at 09.10 hours, and the Argosy will take off at 09.45 hours. On the following Tuesday cars will leave the Central Hotel, Glasgow, at 08.40 hours, and the liner will start from Renfrew Aerodrome (provided, of course, that that delectable spot is then visible in the matutinal mist) at 09.30 hours.

Car connections are included in the fare of five guineas for a single passage or £10 return, and the usual *Silver Wing* service and facilities will be provided en route.

CIVIL AIRCRAFT.

In the House of Commons on May 9, in reply to a question by Lieut.-Cmdr. Kenworthy, the Under-Secretary of State for Air said that according to the information available, the number of civil aircraft owned by companies operating regular air transport services in His Majesty's Dominions was 227 and the corresponding figures for other countries were:—United States of America 619, France 411, Germany 265, Italy 64. He had no information in regard to the number in the Union of Socialist Soviet Republics.

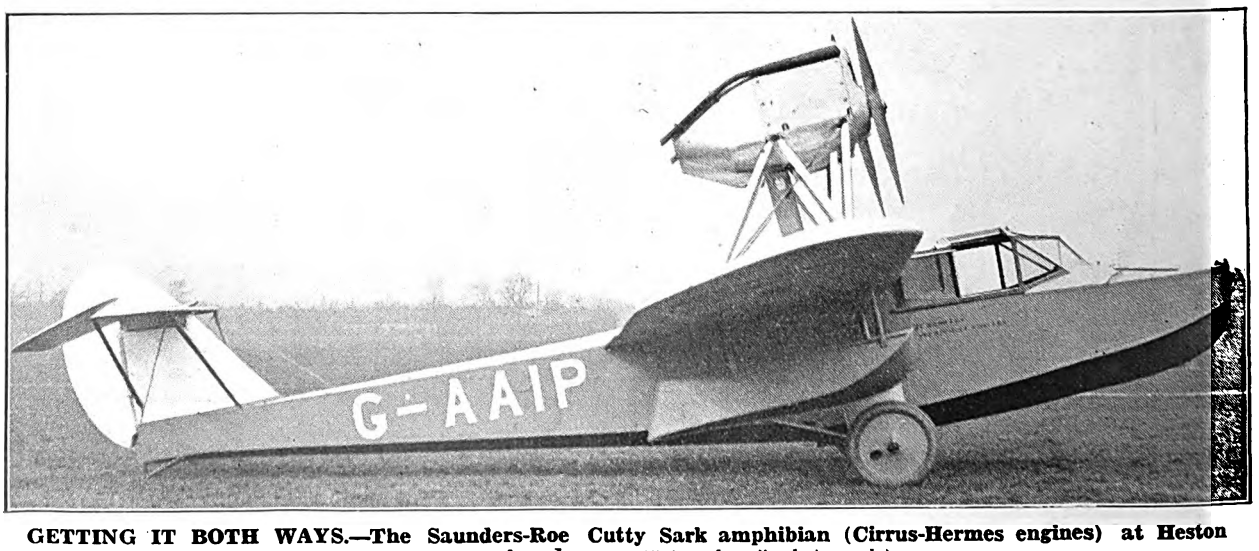
THE OWNER.—Mr. Norman Holden, owner of the Cutty Sark amphibian, and Mrs. Holden, with Mr. E. G. Hordern, their pilot.—(*"Aeroplane" photograph.*)

AN ITALIAN VENTURE.

Some time ago Mr. Francis Lombardi and a mechanic flew from Rome to Mogadiscio, which is presumably Mogdishu, on the eastern coast of Italian Somaliland, by way of Tripoli, Tobruk, Cairo, Massaua, which is in Eritrea, the Italian territory on the Red Sea, and Bender Cassim, which is on the Red Sea coast of Italian Somaliland. Apparently no stop was made at Cairo, which seems sensible.

One gathers that the flight was intended to show, besides the capabilities of Italian light aircraft, the fact that Italian Somaliland can be reached without landing at places other than those in Italian territory. The machine in which this trip was made was a Fiat A.S.1 (85 h.p. Fiat A.50 engine).

A report states that two Italian airmen have arrived at Juba, which is a stopping place on the Cape—Cairo air route, in a motor. They had come from Yambio (which is not on the office map) where their aeroplane had been left in a damaged condition.



GETTING IT BOTH WAYS.—The Saunders-Roe Cutty Sark amphibian (Cirrus-Hermes engines) at Heston Aerodrome.—(*"Aeroplane" photograph.*)

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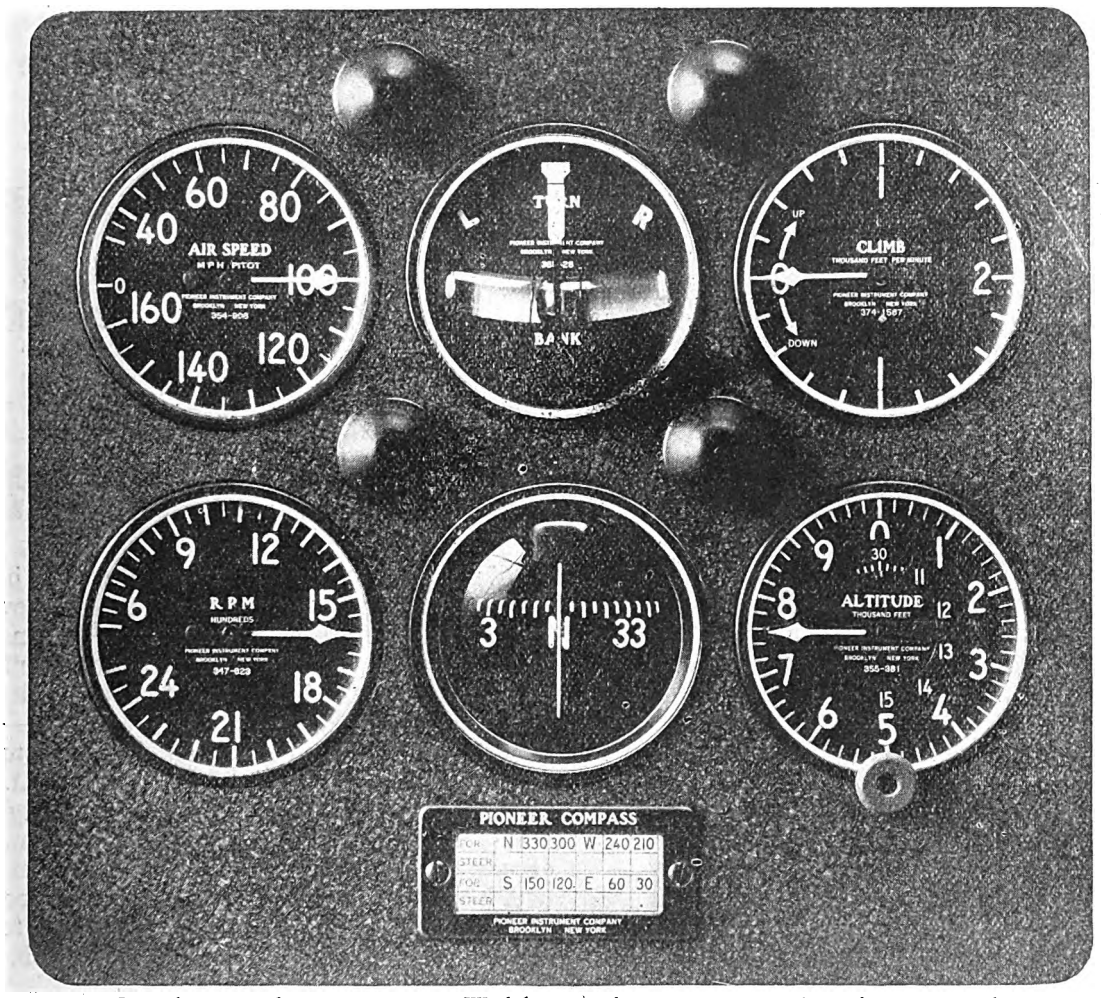

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, May 6.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—Flt. Lt. J. N. D. Anderson (Lt., R.A., R.A.R.O.) is granted a perm. comn. in this rank (May 1).

The following Plt. Offs. are promoted to the rank of Flg. Off.:—G. R. Montgomery (Feb. 24); R. J. T. Barrett. J. Cherrill, J. O. H. Lobley, P. B. Rogers, J. R. Stebbing, A. N. I. Worger-Slade (Apr. 12).

The following cease to be attached to the R.A.F. on return to Naval duty:—LT., R.N., FLT. LT., R.A.F.—R. A. Peyton (Apr. 15). LTS., R.N., FLG. OFFS., R.A.F.—A. N. R. Keene (Apr. 14); W. S. Lea (Apr. 15). Lt. R. C. Giles, R.M., Flg. Off., R.A.F., ceases to be attached to the R.A.F. on return to duty with the Royal Marines (Apr. 21.)

Plt. Off. on Probation G. W. D. Frayling relinquishes his S.S. comn. on account of ill-health (Apr. 19).

The S.S. comns. of the following Plt. Offs. on Probation are terminated on cessation of duty:—M. H. Ballantyne (Apr. 30); S. H. Turner (May 7).

Sub-Lt. C. D'O. Umfreville, R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on resigning his comn. in the Royal Navy (Apr. 17).

STORES BRANCH.—Flg. Off. R. H. Clay is transferred to the Reserve, Class B (May 1).

MEDICAL BRANCH.—The following Flg. Offs. are promoted to the rank of Flt. Lt.:—R. E. Alderson, M.B., B.S. (May 1); A. R. French, M.R.C.S., L.R.C.P., J. H. Cullinan, M.R.C.S., L.R.C.P., P. J. Nyhan, M.B., B.Ch. (May 2).

Flt. Lt. W. Heron, M.B., B.Ch., is transferred to the Reserve, Class D.ii. (May 7).

CHAPLAINS BRANCH.—The Rev. A. R. A. Watson is granted a S.S. comn. as a Chaplain (Church of England) with the relative rank of Sq. Ldr. (May 1); the Rev. R. H. Horton resigns his S.S. comn. (May 1).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—H. E. Reekie (Apr. 9); J. H. Thompson (Apr. 23).

The following officers are transferred from Class A to Class C:—Flt. Lt. C. V. Lock (May 4); Flt. Lt. O. J. F. Jones-Lloyd (July 4, 1929); Flg. Off. J. G. Hay (Apr. 15).

The following Flg. Offs. relinquish their comns. on completion of service:—W. A. R. Speight (May 5, 1929); T. N. Stack, A.F.C. (Sept. 21, 1929); S. G. Williams (Dec. 9, 1929); A. B. Cree (Mar. 29); G. F. Blackburn (Apr. 23).

The following Flg. Offs. relinquish their comns. on completion of service, and are permitted to retain their rank:—A. L. Pearce (Apr. 15); K. R. Thomas (Apr. 28).

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—The following Plt. Off. to be Flg. Off.:—J. S. Feather (Jan. 10).

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—Plt. Off. S. J. Huins relinquishes his comn. on account of ill-health and is permitted to retain his rank (Apr. 7).

Appointments.

Week ending May 12, 1930.

GENERAL DUTIES BRANCH.—Group Captain L. A. Pattinson, D.S.O., M.C., D.F.C., to Air Ministry (D.O.S.D.), on appointment as Deputy Director of Organisation, 7/5.

Wing Commanders R. Collishaw, D.S.O., O.B.E., D.S.C., D.F.C., to H.M.S. *Courageous* whilst attending Senior Officers Technical Course, Portsmouth, 5/5. A. R. Arnold, D.S.C., D.F.C., to R.A.F. Depot, Uxbridge, whilst attending Senior Officers' Technical Course, Portsmouth, 5/5. J. H. S. Tyssen, M.C., to R.A.F. Base, Gosport, to command, 7/4. C. F. A. Portal, D.S.O., M.C., to H.Q., Coastal Area, Supernumerary, on completion of special duty in India, 18/4. T. G. Hetherington, C.B.E., to R.A.F. Depot, Uxbridge, on relinquishing appointment as Air Attaché, Washington, 1/4.

Squadron Leaders H. Leedham, to Special Duty List, 22/4. T. H. Newton, D.S.C., to R.A.F. M.T. Depot, Shrewsbury, 25/4. A. L. Gregory, M.B.E., M.C., to C.F.S., Wittering, 6/5. L. G. le B. Croke, to R.A.F. Training Base, Leuchars, 3/5. R. Harrison, D.F.C., to No. 17 Sqdn., Upavon, 29/4.

Flight Lieutenants T. A. Warne-Browne, D.S.C., to R.A.F. Depot, Uxbridge, 25/4. H. F. Bradley, to R.A.F. Depot, Uxbridge, 26/4. F. H. Astle, to No. 1 School of T.T. (Apprentices), Halton, 28/4. L. de V. Chisman, to No. 13 Sqdn., Netheravon, 1/5. M. H. Garnons-Williams, to A. and G. School, Eastchurch, 5/5. S. G. Connolly, to A. and G. School, Eastchurch, 5/5. The Earl of Bandon, to C.F.S., Wittering, 2/5. C. B. S. Spackman, D.F.C., to No. 111 Sqdn., Hornchurch, 11/5. A. R. Jones, to No. 208 Sqdn., Middle East, 24/4. H. R. F. Baxter, to R.A.F. Depot, Uxbridge, 1/5. D. V. Carnegie, A.F.C., to R.A.F. Depot, Uxbridge, 2/3. H. G. W. Lock, D.F.C., to No. 12 Sqdn., Andover, 8/4. R. Ivelaw-Chapman, D.F.C., A.F.C., to No. 56 Sqdn., North Weald, 8/4. S. J. Smetham, to No. 33 Sqdn., Eastchurch, 1/4. H. J. Adkins, to R.A.F. Depot, Uxbridge, 10/4. G. N. J. Stanley-Turner, to R.A.F. Depot, Uxbridge, 10/4.

Flying Officers G. J. Ross, to R.A.F. Depot, Uxbridge, 10/4. C. A. C. Patton, to R.A.F. Depot, Uxbridge, 10/4. C. Stephenson, to No. 6 Sqdn., Middle East, 26/4. J. C. B. Tingling, to R.A.F. Depot, Uxbridge, 1/5. J. C. Harcombe, to R.A.F. Depot, Uxbridge, 1/5. J. W. Hutchins, to R.A.F. Base, Calshot, 1/5. G. Lansdowne, D.F.C., to H.Q., A.D.G.B., 1/5. F. L. Kingham, to Coast Defence Co-operation Flight, Eastchurch, 8/5. J. S. Phillips, to Station H.Q., Manston, 6/5. H. G. Loch, to No. 1 Sqdn., Tangmere, 5/5. R. K. Hamblin, to E. and W. School, Cranwell, 28/4.

Pilot Officers—The undermentioned Pilot Officers are all posted to No. 3 F.T.S., Grantham, with effect from 26/4:—J. W. P. Armitage, G. V. Barber, R. J. W. Barnett, C. F. Birks, G. A. Bolland, J. A. S. Brown, L. A. Bullard, R. G. E. Catt, R. N. Clarke, L. J. Crosbie, K. B. B. Cross, E. Dawson, A. E. Dobell, G. F. K. Donaldson, R. B. Harrison, H. O. Haughton, P. Haynes, E. J. N. Heaven, G. H. Leftwich, D. L. McAllister, D. W. Morrish, J. G. B. O'Hagan, A. E. B. Trappes-Lomax, L. J. M. White and G. W. Williams.

MEDICAL BRANCH.—Group Captain J. MacGregor, M.C., to R.A.F. Depot, Uxbridge, Supernumerary, on transfer to Home Establishment, 20/4.

Wing Commander A. S. Glynn, to H.Q., R.A.F., Middle East, for duty as P.M.O., 14/4.

Squadron Leader W. E. Hodgkins, to H.Q., Inland Area, Stanmore, 5/5.

Flight Lieutenant C. P. O'Toole, to R.A.F. Depot, Uxbridge, 23/3.

STORES BRANCH.—Wing Commander F. C. Williams, O.B.E., to Air Ministry (D. of E.), for duty as R.A.F. Representative on the Board of Management, Navy, Army and Air Force Institutes, 22/4.

Squadron Leader P. M. Brambleby, to R.A.F. Depot, Uxbridge, 1/4.

Flight Lieutenant F. C. Griffin, to No. 2 Stores (Ammunition) Depot, Altrincham, 4/5.

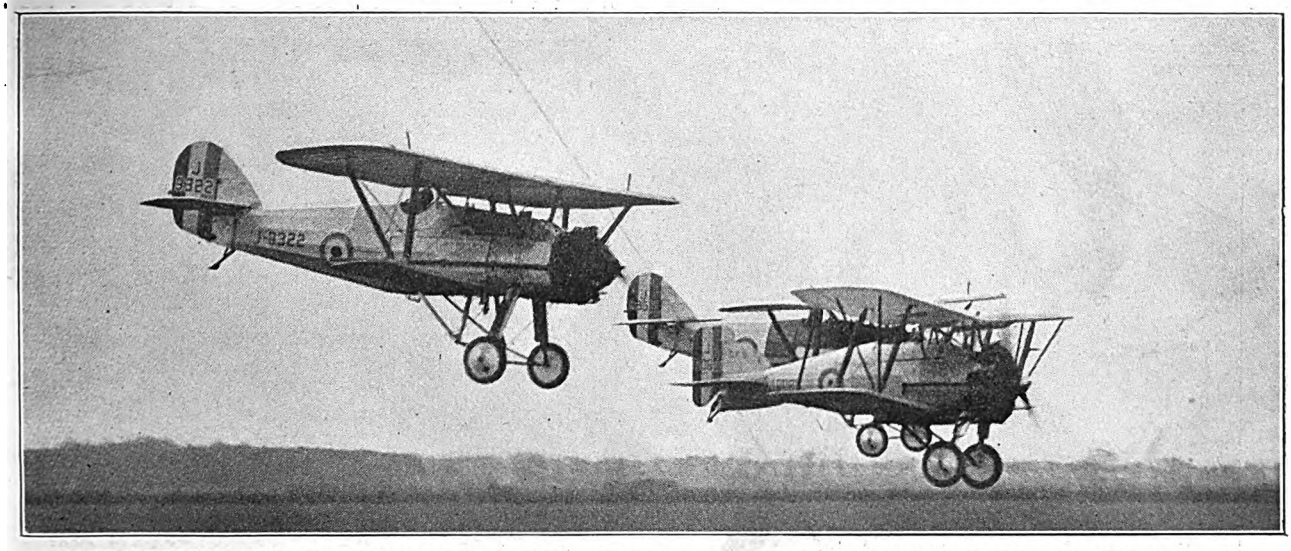
Flying Officer N. W. Law, to R.A.F. Depot, Uxbridge, 1/4.

Pilot Officers—The undermentioned are all posted to the Home Aircraft Depot, Henlow, with effect from 28/4:—F. C. Read, W. A. Lee, L. Llewellyn, E. N. Lowe, J. W. C. Revill, G. C. Allen, B. S. Cartmel.

ACCOUNTANT BRANCH.—Flight Lieutenant R. G. Dyer, to R.A.F. Depot, Uxbridge, 8/4.

Flying Officer G. H. White, to H.Q., 'Iraq Command, 26/4.

CHAPLAINS BRANCH.—The Rev. A. R. A. Watson, M.A., to E. and W. School, Cranwell, on appointment to a S.S. Commission, 1/5.



ADVANCED TRAINING.—A Fighter formation of the Central Flying School, R.A.F., landing at Wittering. The leading machine of the flight is a Gamecock and the other two are Siskins.—(*"Aeroplane" photograph.*)

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THE HIGHER COMMANDS.

The Air Ministry announces the following appointments:—

Air Vice-Marshal Sir John Miles Steel, K.B.E., C.B., C.M.G., now Air Officer Commanding, Wessex Bombing Area, Air Defence of Great Britain, to command the Royal Air Force in India at the end of February 1931, vice Air Marshal Sir William Geoffrey Hanson Salmond, K.C.B., K.C.M.G., D.S.O., on the latter terminating his period of appointment.

Air Vice-Marshal Edgar Rainey Ludlow-Hewitt, C.B., C.M.G., D.S.O., M.C., now Commandant of the Royal Air Force Staff College, to be Air Officer Commanding, 'Iraq Command, in October next, vice Air Vice-Marshal Sir Robert Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C., on the latter terminating his three years' appointment.

Air Commodore Philip Bennet Joubert de la Ferté, C.M.G., D.S.O., now Air Officer Commanding, No. 23 Group, Inland Area, to be Commandant of the Royal Air Force Staff College in September next.

AIR VICE-MARSHAL SIR JOHN STEEL.

Air Vice-Marshal Sir John Steel, K.B.E., C.B., C.M.G., was born in India in 1877 and was educated at Stubbington House and in H.M.S. *Britannia*. He entered the Royal Navy as a Cadet in 1892 and was promoted Sub-Lieutenant in 1898 and Lieutenant in 1900. He served in the South African War with the Naval Brigade and took part in the Relief of Ladysmith and subsequent operations, for which he was awarded the African General Service Medal. He was wounded in action at Elandslaagte. He also took part in the Gambia River Expedition, for which he was awarded a medal and was mentioned in dispatches. He was promoted Commander in 1912 and Captain in 1916.

He served with the Grand Fleet in the Battle of Jutland as Second-in-Command of H.M.S. *Conqueror* and was awarded the Russian Order of St. Stanislas (2nd class with swords) for distinguished services rendered in that action. In 1917 he was appointed to the Royal Naval Air Service and placed in command of the R.N.A.S. Station at Eastchurch.

On the formation of the R.A.F. in April 1918 he was given the temporary rank of Brigadier-General and appointed Group Commander. In the New Year Honours of 1919 he was awarded the C.B.E. for valuable services during the War. He was awarded a C.M.G. in June 1919 for distinguished services during the War. In August 1919 his name was removed from the Navy List on appointment to a permanent commission in the R.A.F. with the rank of Air Commodore.

In September 1919 he was appointed Director of Operations and Intelligence at the Air Ministry and in 1922 he was appointed Deputy Chief of the Air Staff. In June 1922 he was made a Companion of the Order of the Bath. From 1923 to 1926 he was an additional member of the Air Council.

He was promoted to Air Vice-Marshal in 1925 and in April 1926 he was appointed to command the Wessex Bombing Area, Air Defence of Great Britain.

In the King's Birthday Honours List of 1926 he was appointed a Knight Commander of the Order of the British Empire.

AIR VICE-MARSHAL LUDLOW-HEWITT.

Air Vice-Marshal E. R. Ludlow-Hewitt, C.B., C.M.G., D.S.O., M.C., was born at Eckington, Worcester, in 1886, and was educated at Radley College, Eastman's School and at the Royal Military College, Sandhurst. He was appointed to the Royal Irish Rifles in 1905 and was promoted to Lieutenant in 1907.

He learned to fly at Upavon on a Maurice Farman biplane and was seconded to the Royal Flying Corps in September 1914. In November 1914 he was appointed a Flight Commander with the temporary rank of Captain and in December 1914 he was promoted Captain Royal Irish Rifles. In March 1915 he went to France, where he joined No. 1 Squadron. He took part in some successful bombing raids during the battle of Neuve Chapelle and did valuable reconnaissance work before and during the fighting at Hill 60.

In June 1915 he was appointed Squadron Commander with the temporary rank of Major and in November 1915 he took over command of No. 3 Squadron. While he was with No. 1 Squadron he had worked on a new method of calling on the artillery to engage sudden targets known as the Zone Call. When he took over his new command he gave much attention to the perfection of the details of this system, which is fully described in the second volume of *War in the Air*,—the official history of the R.A.F. In January 1916 he was awarded the Military Cross for distinguished service in the Field.

In February 1916 he was appointed to command the Third (Corps) Wing at Bertangles and was given the temporary rank of Lieutenant-Colonel. In July, 1917, he was awarded the Croix de Chevalier, Legion of Honour (France).

At the end of 1917 he was restored to the Home Establishment and appointed Inspector of Training and graded as a Brigade Commander. He was made a Companion of the Distinguished Service Order in January 1918 for distinguished service in the Field.

In May 1918 he returned to France to command a Brigade, and was commanding a Brigade at Lille at the time of the Armistice.

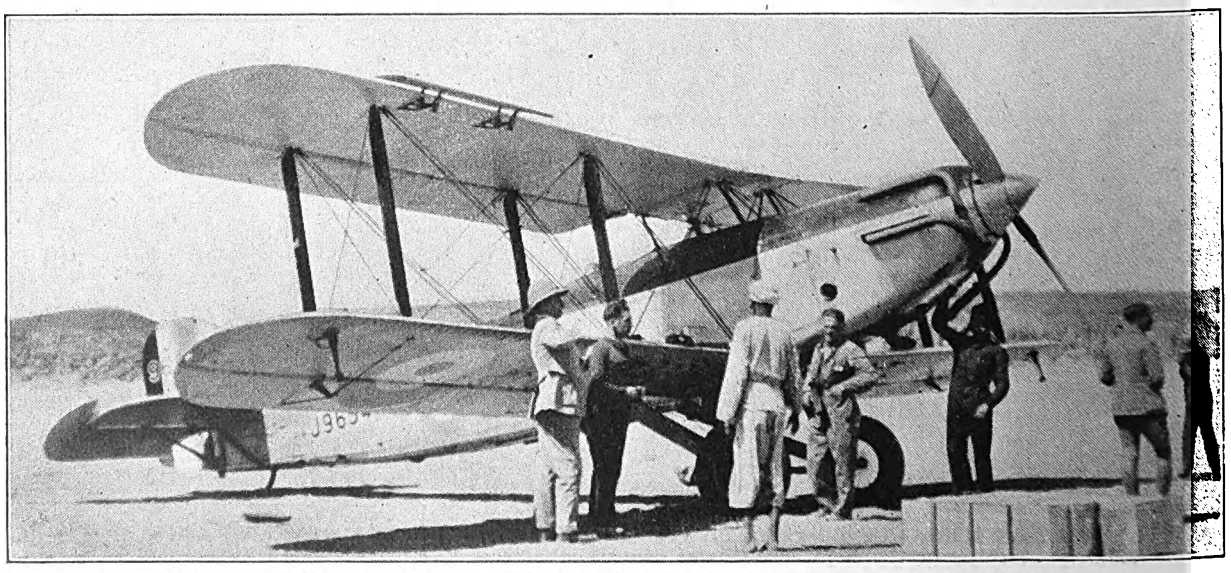
In June 1919 he was appointed Deputy Director of Training with the acting rank of Colonel. In the King's Birthday Honours of 1919 he was appointed a Companion of the Order of St. Michael and St. George in recognition of distinguished services rendered during the War.

In August 1919 he resigned his Army Commission on appointment to a permanent commission in the R.A.F. with the rank of Group Captain. He was mentioned in despatches from France six times.

For two years from July 1921 he was Aide-de-Camp to the King. In February 1922 he was appointed Air Secretary to the Secretary of State for Air. In March 1923 he was appointed Commandant of the R.A.F. Staff College and in June 1923 he was promoted Air Commodore.

He was made a Companion of the Order of the Bath in the King's Birthday Honours of 1928. And he was promoted Air Vice-Marshal in January 1930.

[Perhaps one may be forgiven for recalling here the fact that one of Air Vice-Marshal Ludlow-Hewitt's peculiarities during the War 1914-18, even when he held high rank, was that he would insist on flying any and every type of machine which came under his command. This was not regarded as quite proper by some officers of equal rank. Another habit of his was to go out with dawn patrols, or with bombing raids which started before dawn, just to see what happened to his squadrons and how they reached their objectives. Occasionally pilots found disconcerting messages from him inquiring why they were not where they ought to have been over enemy territory when he happened to pass that way. All of which earned for him the high esteem of the best



DESERT RATIONS.—A Fairey III.F of No. 45 (Bomber) Squadron refuelling at Assuan.

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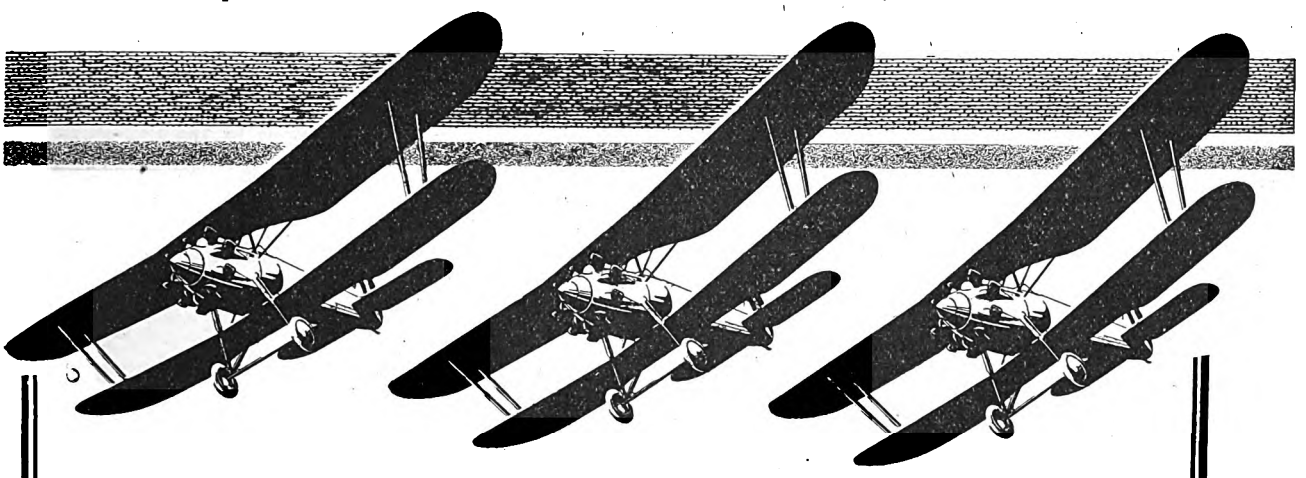

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war-pilots, and made those of lower quality quite uncomfortable. His splendid Service record should assure for him success in 'Iraq, where something like Service conditions still persist.—C. G. G.]

AIR COMMODORE JOUBERT DE LA FERTE.

Air Commodore P. B. Joubert de la Ferté, C.M.G., D.S.O., who is one of the pioneers of Service Aviation, was born at Darjeeling, Bengal, in 1887 and was educated at Stanmore, at Harrow and at the R.M.A., Woolwich. He entered the Royal Artillery in 1907 and was promoted to Lieutenant in 1910. He learned to fly in a Bristol biplane at Brooklands and his Royal Aero Club certificate, No. 280, is dated Sept. 3, 1912.

In March 1913 he was seconded to the Royal Flying Corps and was appointed Flight Commander with the temporary rank of Captain in July 1914. He went to France with No. 3 Squadron, R.F.C., in August 1914, and many references to him during this period of his service are made in *Five Years in the R.F.C.*, by Major J. B. McCudden, V.C., which has recently been re-issued under the title of *Flying Fury*.

He was one of the two pilots who made the first air reconnaissance of the War. On Aug. 19, 1914, he started at 9.30 a.m. alone in a Blériot to reconnoitre Nivelles-Genappe in order to report what Belgian forces were in the neighbourhood. He attempted to steer by compass through banks of clouds, and after two hours of wandering about he landed at Tournai. He could hear no news of the Belgian Army, and took off again. He again lost his way, and landed at Courtrai, where he was told that the Headquarters of the Belgian Flying Corps was at Louvain. He eventually got back to Maubeuge late in the afternoon and was able to report occasional trains in the main stations and pickets on the roads to Brussels.

He returned to England in October 1914, and at about that time was promoted Captain, R.A. In May 1915 he went back to France as a Squadron Commander with the temporary rank of Major and took part in the Battle of Loos in command of No. 1 Squadron, R.F.C., which was part of the Second Wing.

In June 1916 he was appointed to command a Wing of the R.F.C. in Egypt, with the temporary rank of Lieutenant-Colonel. In January 1917 he was made a Companion of the Distinguished Service Order for distinguished service in the Field.

In February 1917 he returned to England and went through the Wing Commander's Gunnery Course. He was promoted Major, R.A., in June 1917.

In April 1918 he was posted to Italy to command the R.A.F. on the Italian Front. For his services in Italy he was awarded the Italian Order of St. Maurice and St. Lazarus and the Italian Croce di Guerra.

In January 1919 he was made a Companion of the Order of St. Michael and St. George for distinguished services rendered during the War. He returned from Italy in March 1919, and in August 1919 he resigned his commission in the Army on appointment to a permanent commission in the R.A.F. with the rank of Wing Commander. He was mentioned in dispatches from France once, from Egypt once, and from Italy five times.

In January 1920 he was posted to the Staff College, Camberley, for a twelve months' course, at the end of which he was appointed an Instructor at the R.A.F. Staff College. He was promoted to Group Captain in June 1922, and in April 1923 he was posted to the Air Ministry as Deputy Director of Personnel.

In September 1926 he was appointed Instructor at the Imperial Defence College. On relinquishing this post in December 1929 he was appointed to command No. 23 Group. He was promoted Air Commodore in July, 1929.

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident at Jhelum, India, to a Bristol Fighter machine of No. 20 (Army Co-operation) Sqdn., Peshawar, on May 5, No. 359557, L-AC. Ernest Raymond Charlesworth was killed and Flg Off. John William Hawke, the pilot of the aircraft, was seriously injured.

R.A.F. Demonstrations in India.

The Times correspondent in Lahore in a message dated May 9 states:—

Royal Air Force machines took part on Wednesday in a demonstration over that point of the Mohmand border where Badshahgul, son of the Haji of Turangzai, has his headquarters.

The strong force used for the demonstration was to give him timely warning and to dissuade him from carrying out an attack on British Indian territory. The latest information shows that the Haji and his son have come to the conclusion that it would be most unwise to make an attack and that the Haji has been informed by three of the principal sections of the Lower Mohmands that they are opposed to his plan and that he must not count on them for support.

A *Reuter* message from Simla on May 9 states:—

Forty machines took part in the R.A.F. demonstration, which, it is understood, had a sobering effect on the tribesmen of the Mohmand country.

The Times correspondent in Peshawar, in a message dated May 12, states:—

An aerial demonstration which has been carried out against a small concentration under the eldest son of the Haji of Turangzai in Mohmand territory has had a good moral effect.

[Judging by reports from Peshawar this annoying old man is a perfectly good Mecca pilgrim (hence the title Haji) who went over to Mohmand territory after being bound over to keep the peace some fifteen years ago, and has been a nuisance at intervals ever since.—ED.]

In the House of Commons on May 12, in reply to questions by various members, Mr. Wedgwood Benn, Secretary of State for India, said that on Saturday, May 10, the Haji of Turangzai and his followers, who some weeks ago had approached within 20 miles of Peshawar, and had constituted a serious menace to public order, had been definitely warned to depart. They had met this warning by blocking the high road with felled trees. Accordingly a raid on them had been made by aircraft on May 12, the results of which were not yet known.

A *Reuter* message from Peshawar on May 12 states:—

An aerial demonstration which has been carried out against a small concentration under the eldest son of the Haji of Turangzai in Mohmand territory has had a good moral effect. Some Mohmands are now hiding in caves.

[Whence no doubt they will be driven in due course by our traditional allies in that area.—ED.]

The Royal Air Force Display.

The eleventh Royal Air Force Display will be held at the R.A.F. Station, Hendon, on Saturday, June 28. Last year a record crowd of 136,000 people attended the Display, and a crowd of 150,000 is the objective of the Committee this year.

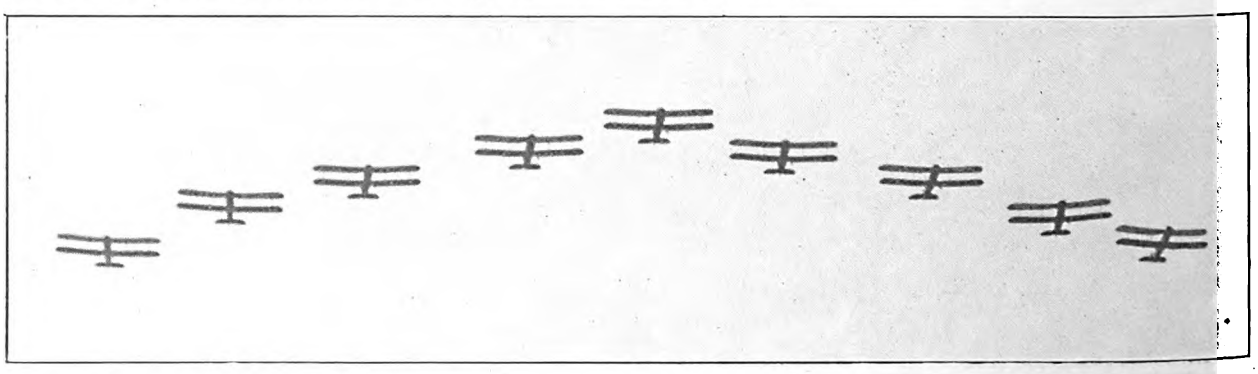
All the enclosures have been increased in size, the existing stands have been enlarged and new stands erected. All the boxes have already been sold. The price of car tickets for the 10s. enclosure has been increased to 10s., but cars are admitted to the 5s. enclosure for 5s. as before.

All tickets except for the 2s. enclosure, for which there is no advanced booking, are now available, and may be had from the Display Secretary, R.A.F. Station, Hendon, or from any R.A.F. Station, or from the Theatre Ticket Agencies.

The gates will open at 10.00 hours, and there will be continuous flying from 12.00 hours until 18.00 hours.

The Aerobatics Competition.

The aerobatics competition between Fighter Squadrons of the R.A.F. to select two pilots representing a squadron to give an exhibition of aerobatics at the R.A.F. Display, will not be held this year. The pilots will be chosen on a selective basis.



AUXILIARIES.—A formation of Westland Wapitis of No. 600 (City of London) (Bomber) Squadron, Auxiliary Air Force. The accurate formation on machines with which they have only recently been equipped illustrates the high standard of training in the Auxiliary Air Force.

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Our Legislators.

In the House of Commons on May 8, Lieut.-Cmdr. Kenworthy asked the President of the Board of Education whether the same facilities as before were to be given for school children to visit the Hendon R.A.F. Display this year. Sir C. Trevelyan replied that no special facilities were provided by the Board of Education, but local education authorities might arrange for the attendance of parties of children at the Display. Lieut.-Cmdr. Kenworthy asked whether the President of the Board of Education had seen the programme of the Display this year. Sir C. Trevelyan said that he had not but that he imagined that he would do so in due course.

[Lieut.-Cmdr. Kenworthy will be shocked to hear that the Display may include a demonstration of the destruction of a Pirates' Lair by a Ruthless Air Force.—ED.]

One Against One Hundred and Fifty Thousand.

In the House of Commons on May 7 Miss Lee asked the Under-Secretary of State for Air whether it was intended to hold the aerial pageant at Hendon this year as on previous occasions; whether any other pageants besides that at Hendon had been projected; if he would state the purpose of aerial pageants and their approximate cost to the nation; and whether he would consider confining the display to civil aviation and excluding all war aircraft from participation in them?

Mr. Montague circulated the following reply in the *Official Report*:—

The answer to the first part of the question is in the affirmative. As regards the second part, no other display of a similar nature to that at Hendon is organised at home by the Royal Air Force, but some Royal Air Force aircraft will be taking part in the civil flying meetings referred to in the reply given to my hon. friend the Member for Southwark, Central (Mr. Day), on Mar. 19. As regards the third part, the purposes for which the display at Hendon is held are to provide an annual inspection and review, corresponding in some degree to the reviews of the Navy and Army at Spithead and Aldershot, as a means of ascertaining the degree of efficiency that is being maintained in the Air Force and as a test of individual and collective skill, to enable the public to see something of the work of the Royal Air Force, and incidentally to raise funds for Air Force charities.

No extra cost over and above that of ordinary training, of which the display forms part, is thrown upon public funds; the cost of all special arrangements and facilities for spectators is met out of the receipts. As regards the last part, my Noble Friend sees no reason for thus altering the character of an annual event in which it is evident, from the attendance, that the general public take a very great interest.

The Army Senior Officers' School.

The following officers of the R.A.F. have joined the Army Senior Officers' School at Sheerness for the second of the three courses arranged for 1930:—

Wing Cdrs. D. Harries, A.F.C., and J. Sowrey, A.F.C.

Promotions of Short Service Officers.

A recent Air Ministry Order states that the Air Council has decided to reintroduce, as regards short service officers entered after June 1, 1930, the system of effecting promotion to the rank of Flying Officer in accordance with the marks obtained on passing out of Flying Training Schools. The marks will include those awarded for qualities as an officer and as a pilot. Short Service officers will accordingly be eligible for promotion (subject to passing the promotion examination and being recommended) as follows:—

Eighty per cent. or more marks on completing 18 months' commissioned service: 70 per cent. to 79 per cent. marks on completing 19 months' commissioned service: less than 70 per cent. marks on completing 20 months' commissioned service.

An officer who passes out later than other officers undergoing the same course will not be eligible for promotion until he has completed 21 months' commissioned service, provided that one who has completed the course, but is unable to take the final examination owing to sickness, may, if recommended by his C.O., be regarded for this purpose as having passed out on the correct date, his marks being assessed by the C.O. on the average of his work throughout the course.

An officer who has not passed the promotion examination by the date of completing 18, 19, 20 or 21 months' commissioned service, as requisite, will normally be promoted with effect from the date of passing the promotion examination.

The R. M. Groves Aeronautical Research Prize.

The R. M. Groves Aeronautical Research Prize for the year 1929 has been awarded to Flt. Lt. R. L. McK. Barbour, D.F.C., A.F.C., Aeroplane and Armament Experimental Establishment, R.A.F., Martlesham Heath.

The R. M. Groves Memorial Prize Essay 1930.

The Air Ministry announces that the R. M. Groves Memorial Essay Prizes for 1930 have been awarded to the following officers:—

1st Prize.—Wing Cdr. B. E. Smythies, D.F.C.
2nd Prize.—Sq. Ldr. R. P. M. Whitham, M.C.
3rd Prize.—Flt. Lt. F. A. Skoulding.

The University Air Squadrons.

Correspondence for the Oxford University Air Squadron from June 19 until Aug. 2, 1930, should be addressed c/o Station Headquarters, Manston, Ramsgate, Kent.

Correspondence for the Cambridge University Air Squadron, from June 16 until July 26, 1930, should be addressed c/o the School of Army Co-operation, Old Sarum, Salisbury, Wilts.

Travelling Concessions.

In the House of Commons on May 7, in reply to a question by Capt. Balfour, the Under-Secretary of State for Air said that he was aware of the recent Admiralty Fleet Order outlining arrangements arrived at between the Admiralty and the Peninsular and Oriental Steamship Company, whereby return tickets to Malta were issued at a special reduced price of £15 to naval ratings below warrant rank, and the question of its extension to corresponding Air Force ranks serving in the Fleet Air Arm aircraft-carriers was already under consideration.

Extension of Allowances.

The school-leaving age for children resident in the City of Bath having been raised to 15 years from Jan. 7, 1930, payment of allowances for children resident in that area will accordingly be continued to the end of the school term in which the age of 15 is reached, subject to the completion by the school authorities of certificates of attendance.

Curiouser and Curiouser.

A daily paper gossip writer has let himself go at the expense of H.M.S. *Glorious*. This ship is alleged to be the most remarkable ship in the Royal Navy. The writer goes on to say:—

H.M.S. Glorious is a 27,000-tonner, can steam at over 30 knots, and has a funnel at one side so that submarines cannot tell in which direction she is going. Royal Flying Corps men, marines and sailors form the crew of *H.M.S. Glorious*, which looks about half as long as Park Lane and in fact is in every way bigger than the *Majestic*. Up in the crow's nest are at least forty telephones. Pilots of the aeroplanes she carries are instructed in the art of torpedoing ships. Each machine has a huge torpedo which only starts when it hits the water. All the pilot has to do is to fly straight towards his victim, discharge his torpedo, and then report back.

The explanation of the offset funnel is interesting. Early aviators will remember that our first aircraft-carriers had no apparent funnel at all. The result was that pilots approaching to land thought that their ship had turned turtle, and therefore remained aloft, so that several died of starvation. Hence the chimney.

To put it on one side was but the work of a moment, and at one fell swoop our pilots are saved and our enemies defeated.

How long is half Park Lane, and who knows how big is the *Majestic*? If only the writer had indicated the number of pennies placed edge to edge along the curb of Waterloo Road several of his readers would, by rifling the automatic machines in the Union Jack Club, have reached a solution in no time.

Considering that the R.F.C. ceased to exist on Mar. 31, 1918, those who regard the Navy as obsolete will be delighted to learn that it maintains thus within itself the relics of another obsolete Service.

The huge torpedo which only starts, but is not really alarmed, when it hits the water, and finds its mark although the pilot merely flies towards his victim without aiming at it, indicates a high level of nervous and intellectual development in these curious Naval pets.

Modern Foreign Languaes.

The following officers and airmen passed the examinations in Modern Foreign Languages set in January 1930 at the centres stated:—

LONDON.

FRENCH.—*Preliminary*: Flt. Lt. D. L. Blackford, *p.s.a.*, Flt. Lt. A. Harvey, M.B., B.Ch, Flt. Lt. J. G. Walser, M.C., *p.s.a.*, Flg. Off. C. J. Cousins, Plt. Off. W. S. Hebden, No. 340748 Cpl. T. M. Hull.
Interpreter (*1st Class*): Wing Cdr. G. S. M. Insall, V.C., M.C., Plt. Off. E. H. Bellairs.
Interpreter (*2nd Class*): No. 335556 L-AC. H. P. Masse
GERMAN.—*Preliminary*: No. 363129 Cpl. H. V. Evans.
SPANISH.—*Preliminary*: Flt. Lt. F. H. Wakeford.
Interpreter (*1st Class*): Plt. Off. E. H. Bellairs.
Interpreter (*2nd Class*): Sq. Ldr. J. H. O. Jones.

MIDDLE EAST.

FRENCH.—*Preliminary*: No. 357067 Cpl. S. R. Davis, No. 353414 L-AC. G. M. Davis, No. 359384 L-AC. F. K. Smith, No. 363330 L-AC. R. D. Roxburgh, No. 362045 L-AC. H. F. Kennedy, No. 363504 L-AC. F. P. Woodcraft, No. 509997 AC.2. C. M. Inglis.
SPANISH.—*Interpreter* (*Requalification*): Sq. Ldr. C. R. Cox, A.F.C., *q.s.*
ARABIC.—*Colloquial*: Sq. Ldr. H. W. G. J. Penderel, M.C., Plt. Off. J. E. Beynon, No. 332916 Cpl. J. W. Sladen, No. 363109 L-AC. P. K. Hodgson.

IRAQ.

ARABIC.—*Colloquial*: No. 370582 L-AC. C. Kimbrey.
SYRIAC.—*Colloquial*: Sq. Ldr. G. S. Reed, O.B.E.

FAR EAST.

GERMAN.—*Preliminary*: Flt. Lt. C. G. Wigglesworth, A.F.C.

INDIA.

BRITISH SERVICE OFFICERS' URDU TEST.—Flg. Off. J. C. A. Johnson

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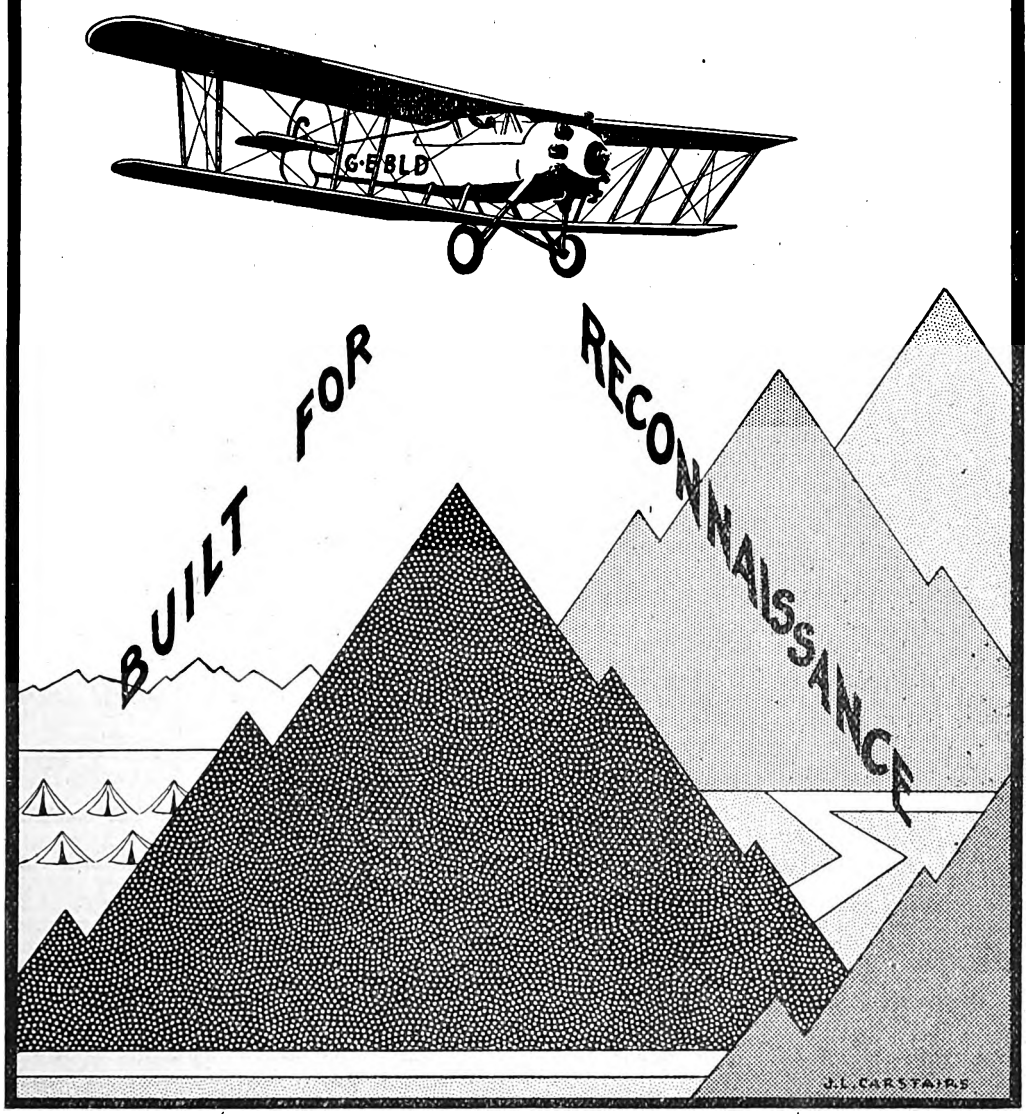
'VESPA'



Vickers "Vespa" Army Co-operation Machines (Bristol Jupiter Engine) supplied to the Bolivian Air Force are operating most successfully from Alto La Paz Aerodrome, which is situated at an altitude of 14,000 feet.

Vickers "Vespas" are also being supplied to the Irish Free State Flying Corps.

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(7.1.29), Flt. Lt. C. B. R. Pelly (1.4.29), Plt. Off. E. N. V. Everett (1.4.29).

URDU QUALIFYING EXAMINATION.—Flg. Off. G. P. Chamberlain (7.10.29).

PRELIMINARY URDU.—Flg. Off. E. C. de V. Lart (1.7.29).

The following awards payable under paras. 418 and 419 of K.R. and A.C.I. may be issued to the officers stated, as laid down in para. 422:—

Wing Cdr. G. S. M. Insall, £38; Sq. Ldr. C. R. Cox, £12 10s.; Sq. Ldr. H. W. G. J. Penderel, £20; Plt. Off. J. E. Beynon, £20; Sq. Ldr. G. S. Reed, £20.

The Middle East Dinner.

The Annual Dinner of the Royal Air Force, Middle East, Dinner Club, will be held at the Connaught Rooms, Great Queen Street, W.C.2, on June 3, at 19.30 hours for 20.00 hours.

Application for tickets (Members 7s. 6d., Members' Guests 12s. 6d., Non-members and guests 17s. 6d.) should be made to F. D. Berridge, Holtside, Rowledge, Farnham, Surrey.

The Triangular Athletic Match.

The annual triangular athletic match between the Royal Military Academy (Woolwich), the Royal Military College (Sandhurst), and the Royal Air Force College (Cranwell) was held at the Stadium, Woolwich Common, on May 10, in the presence of the Commandants of the three Colleges and other distinguished spectators and a number of past and present Cadets.

Woolwich won the match, with a score of 65 points, for the first time since the R.A.F. College, Cranwell, was included in the contest in 1927. Sandhurst, who have held the shield for three years, were second with 63 points, and Cranwell were third with 61 points. This is by far the closest scoring since the beginning of the competition and Cranwell is very much to be congratulated in putting up such a good show against Woolwich and Sandhurst, both of which have far greater numbers of cadets to draw on.

Two new records for the meeting were put up. L. D. Way (Sandhurst) the 100 yards in 9 4-5 seconds, a time which has not been beaten within the Amateur Athletic Association since 1912, and H. A. V. Hogan (Cranwell) jumped 22 feet 0½ inch in the Long Jump.

The results in detail were:—

High Jump.—J. Sheffield (Lancing and Woolwich), 5 ft. 6 in., 1; H. A. V. Hogan (Malvern and Cranwell) and D. G. Vaughan-Fowler (Imperial Service College and Cranwell), 5 ft. 5 in., equal, 2; R. P. Griffin (Imperial Service College and Woolwich) and S. V. Gilkison (Rugby and Sandhurst), 5 ft. 3 in., equal, 4.

100 *Yards.*—L. D. Way (Wellington and Sandhurst), 1; T. A. B. Parcelle (Cheltenham and Cranwell), 2; D. B. D. Field (Bedford and Cranwell), 3; W. H. Summers (Hymers and Sandhurst), 4. Won by half a yard. Time, 9 4-5 sec.

One Mile.—J. H. Taylor (Lancing and Woolwich), 1; R. H. Bellamy (Sherborne and Sandhurst), 2; K. R. Farquhar (Blundell's and Woolwich), 3; S. J. L. Hill (Marlborough and Sandhurst), 4. Won by 3 yards. Time, 4 min. 38 1-5 sec.

Putting The Weight.—A. J. S. Watson (Abingdon and Sandhurst), 37 ft. 5½ in., 1; P. G. Hobbs (Wellington and Woolwich), 2; Z. A. K. Qizilbash (Government College, Lahore, and Sandhurst), 3; J. A. Crawford (Cheltenham and Woolwich), 4.

440 *Yards.*—R. W. Craddock (Charterhouse and Sandhurst), 1; C. H. Stoneley (Blundell's and Woolwich), 2; T. A. B. Parcelle (Cheltenham and Cranwell), 3; G. C. Reeves (Cranleigh and Woolwich), 4. Won by inches. Time, 51 4-5 sec.

Long Jump.—H. A. V. Hogan (Malvern and Cranwell), 22 ft. 0½ in., 1; T. H. Hardy (Haileybury and Woolwich), 2; R. E. Nash (Sandhurst), 3; N. C. Walker (Canford and Cranwell), 4.

120 *Yards Hurdles.*—W. H. Summers (Hymers and Sandhurst), 1; H. A. V. Hogan (Malvern and Cranwell), 2; D. G. Vaughan-Fowler (Imperial Service College and Cranwell), 3; K. R. Farquhar (Blundell's and Woolwich), 4.

Two Miles.—J. W. C. More (Haileybury and Cranwell), 1; D. H. Molesworth (Marlborough and Woolwich), 2; G. W. H. Peters (Sherborne and Sandhurst), 3; J. R. Malet (Wellington and Sandhurst), 4. Won easily. Time, 10 min. 6 2-5 sec.

Half-mile.—C. H. Stoneley (Blundell's and Woolwich), 1; J. H. Taylor (Lancing and Woolwich), 2; D. G. Vaughan-Fowler (Imperial Service College and Cranwell), 3; T. P. H. du Boulay (Wellington and Sandhurst), 4. Won by a yard. Time, 2 min. 7 sec.

A number of elaborate contrivances including loud speakers had been arranged on the ground to enable the spectators to follow the results and the scoring. One good serjeant-major with a megaphone would have been a vast improvement on the whole lot. It was almost impossible to hear or see any results from the middle of the stand. One would suggest that if and when this competition is held at the R.A.F. Stadium at Uxbridge, the Woolwich Stadium authorities should attend and see what a Stadium ought to be like and how things ought to be done.—C. M. MCA.

THE GLOSTER IV.A.

The Times of May 13 states:—

The Gloster 4 A seaplane, which was built for the Schneider Trophy race of 1927 but was not flown in the race, has been sold by the Air Ministry without its engine to Mr. Amherst Villiers, who is interested in devices for super-charging. No statement has been made at present as to the use which is likely to be made of the machine, but as its speed in 1927 was estimated at about 240 miles an hour, it is unlikely that any attempt on the world's speed record for seaplanes is contemplated. The winner's speed in the Schneider Trophy race was over 328 miles an hour.

A FRENCH NAVAL REVIEW.

On May 10 the biggest naval force yet seen at Algiers, the French Naval Division off that station, was reviewed by the President of the French Republic. The first squadron was commanded by Vice-Admiral Durand-Viel, and consisted of 47 ships and three flights of aeroplanes. The second, under Vice-Admiral Ledo, mustered 19 ships and eight flights of aeroplanes. The aeroplanes preceded and escorted the first group in the review.

A CHILEAN AIR FORCE.

Some few months ago the Chilean Government decided to combine the Air Services of the Army and Navy into one Air Corps. In this Chile has followed the lead of Great Britain, and now comes into line with the system in use in France, Italy, Finland and Lithuania.

Where the Chilean system differs from that of any other country is that the new Corps is placed under the Ministry of the Interior, which will thus become concerned with combatant affairs instead of being concerned only with civil police and other internal administration.

Capt. Senor Andrés Sosa has recently been appointed Air Attaché in London.

THE VISIT OF THE GRAF ZEPPELIN.

In the House of Commons on May 7, in reply to a question by Mr. Day, the Under-Secretary of State for Air said that no protests or complaints had been received by the Air Ministry of the incident in which the *Graf Zeppelin* passed over the Wembley Stadium during the progress of the Football Cup Final on April 26. The Airship Construction Company, Friedrichshafen had stated in a telegram of April 25 to the Air Ministry that the *Graf Zeppelin* would be passing over London between 3 and 4 p.m., but no mention had been made of Wembley.

In addition to civilian employés of the Royal Airship Works, Cardington, 100 airmen from Henlow had been detailed to assist in landing the airship.

THE AIRSHIP CRUISE.

In the House of Commons on May 7, in reply to a question by Sir A. Pownall, the Under-Secretary of State for Air said that the Secretary of State for Air hoped that a flight in R.100 or R.101 in July next for Members of Parliament could be arranged.

THE R.C.A.F.—Officers of the Royal Canadian Air Force with their Avro Avians (Genet Major engines). These machines were built by the Ottawa Car Co. Ltd., who hold the Avro manufacturing licence in Canada. They have metal fuselages, Goodyear Air-wheels, and Handley Page slots as standard components.

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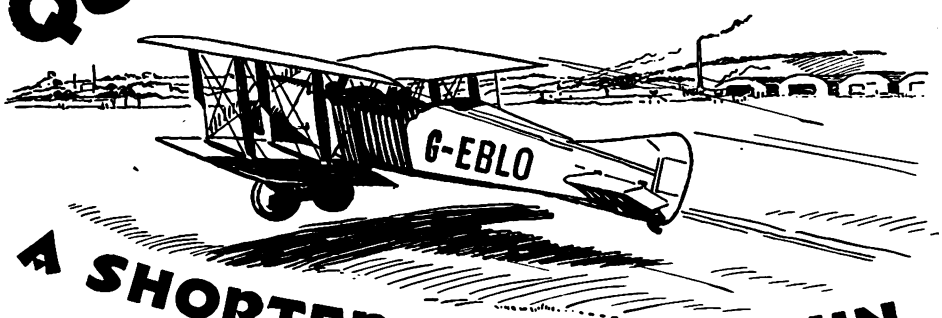
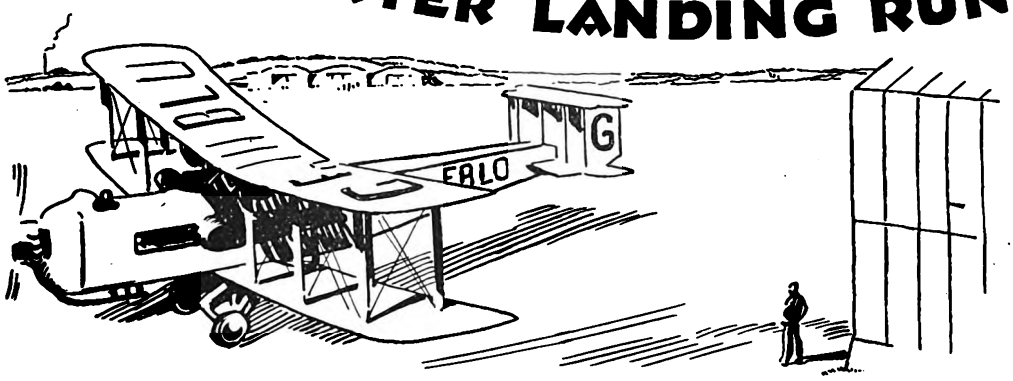
A QUICKER TAKE-OFF



A SHORTER LANDING RUN



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MAKING THE AIR SAFE FOR CATERPILLARS.

[*Parachutes for Airmen.* By Charles Dixon. 120 pages, 7¼ in. x 5 in., illustrations and index. Sir Isaac Pitman and Sons. Supplied by THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, E.C.4. 7s. 9d. post free.]

The parachute is an essentially simple piece of apparatus, which is, perhaps, why Mr. Dixon has been led to pad his book somewhat with material of no compelling interest and rather spoil the general good effect. Nor is such padding at all necessary, unless the history of the parachute is so meagre as merely to provide a preface which rouses an appetite for historical details without going on to satisfy it. Instead of such glances into the romantic past of the parachute we are given, in the first chapter, a discussion of the reasons why parachutes are not more generally used, and this psycho-analysis of the average pilot who does not take silk is not half so enlightening as the few sentences which set forth the price of various makes and kinds.

Far more to the point are the following discussions on manual and automatic release, for and against pilot-chutes, various designs of canopy, etc. These go much farther to achieve the apparent aim of the book than do the patently propagandist parts, as they leave an impression that almost any make of parachute is highly dependable.

The purely technical portion, on care, maintenance and packing, is no doubt valuable, but not of vital interest unless one has a parachute to practise on; and in that case there would probably be a book of instructions in the package, so most readers will postpone this chapter. The chapters dealing with latest developments, the sensations of the parachutist, and some stories driving home the necessity for a parachute in (or under or on) every seat, are both fascinating and enlightening. They embody some useful warnings on probable pitfalls, and explain certain phenomena in a very clear way.

Knowing several of the strong silent men who go up to the sky in ships and come back to earth in parachutes one had rather gathered that the sensations were indescribable, but Mr. Dixon does it so plausibly as to arouse the dim flicker of an ambition to see whether it really is like that.

To one who has always supported parachutes on principle, but has never been supported by one, for reasons connected with shallow purses and cold feet, "Parachutes for Airmen" alternately disappoints and interests, with a balance in favour of the latter. The illustrations are copious and good, though one of the very few inaccuracies one was competent to detect in the book was the description of a pictured D.H.9a as a Moth.

Pilots, if any, to whom the parachute is still a holy and rather dreadful mystery, will do well to read the results of Mr. Dixon's researches. They will undoubtedly think more seriously afterwards of the aerial lifebelt; and the casually interested may develop a more compelling urge to use what is certainly a common-sense precaution and practical life-insurance.—F. D. B.

BY AIR TO INDO-CHINA.

[*Flying Gypsies.* By Violette de Sibour, The Chronicle of a 10,000-mile air vagabondage. 306 pages, 8 in. x 5½ in., and 24 illustrations and 8 maps drawn by Jacques de Sibour. G. B. Putnam's Sons. Supplied by THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, E.C.4. 11s. post free.]

In this book the Vicomtesse de Sibour has told in a lively and entertaining manner the story of her flight with her husband in their Gipsy Moth, from England to Indo-China, for a big-game shooting expedition. The dangerous but picturesque country over which they flew, the adventures of forced landings, and the varied types of people whose hospitality they accepted, are all described in a vivid and unusual style.

That any couple so careless and light-hearted should ever have reached their destination at all seems to be a miracle until in reading the book one realises what a small part of the journey would have been completed without the continual help of the Royal Air Force, and of air transport companies at the various landing grounds.

The book is a mass of irritating mistakes, caused by sheer carelessness in writing and editing, and by confused thinking. The author writes of the "Cyrus" engine, calls the R.A.F. Unit at Heliopolis "Twenty-seven" Squadron (which unit is at Kohat), she spells Caproni with a small c, and blazer with a capital B. She refers to the R.A.F. as the "air-force" and spells Amanullah as Ammamullah.

In a desperate attempt to be practical and helpful to other women who may do the same trip she gives a list of her kit describing her clothes as Beige (which is a colour) instead of giving an idea of what material they were made.

In spite of all this it is an interesting book, the subject of which could have made it twice as long without being dull.—C. M. MCA.

INTERNATIONAL RECORDS.

The following performances have been homologated as International Records by the F.A.I.:—

CLASS C.

Carrying Useful load of 1,000 *kgs.* (2,200 *lbs.*).—Duration (France), 18 hrs. 1 min.; Distance in closed circuit (France). 3,309.9 kms. (2,055 miles). By MM. Costes and Codos on Breguet XIX (600 h.p. Hispano-Suiza engine), Feb. 15-16, 1930.

Carrying Useful load of 5,000 *kgs.* (11,000 *lbs.*).—Duration (Italy), 1 hr. 31 mins.

Carrying Useful load of 7,500 *kgs.* (16,500 *lbs.*).—Duration (Italy), 1 hr. 31 mins.; Altitude (Italy), 3,231 m. (10,598 ft.).

Carrying Useful load of 10,000 *kgs.* (22,000 *lbs.*).—Duration (Italy), 1 hr. 31 mins.; Altitude (Italy), 3,231 m. (10,598 ft.).

Greatest load carried to 2,000 m. (Italy), 10,000 kgs. All by Cav. Domenico Antonini in Caproni Ca 90 (six 1,000 h.p. Isotta-Fraschini engines), Feb. 22, 1930.

TAKING SILK.—Six pilots of the U.S. Air Corps exhibiting nonchalance—and Irwin seat-pack parachutes. Note the rip-cord rings in their pockets on the left hip of each pilot. The Irwin is standard in most of the World's Air Forces and has saved several hundreds of lives.

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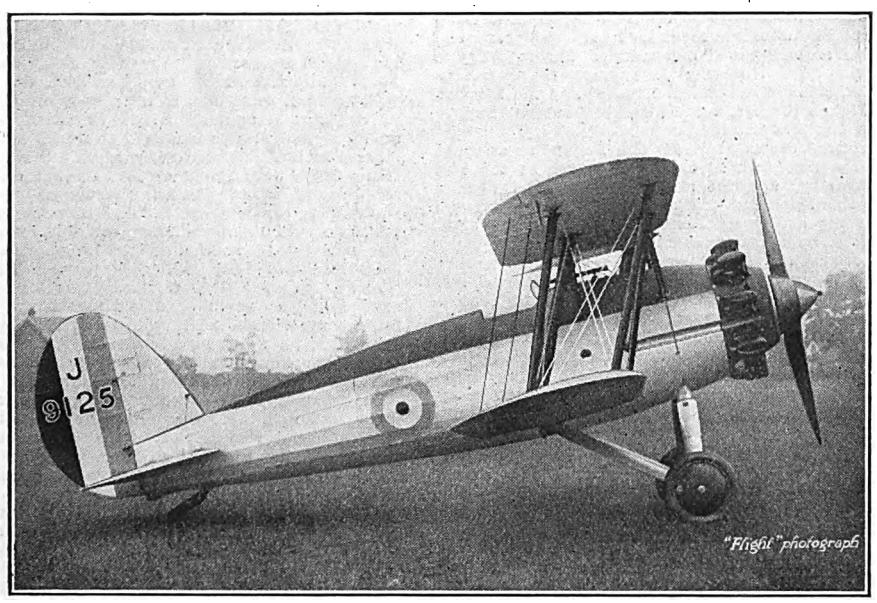

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AIRSHIP VERSUS AEROPLANE.

A debate on the rival merits of the Airship and the Aeroplane was held by the Aviation Group of the Forum Club recently. The principal speakers were Commander Sir C. Dennistoun Burney (Airships), and Mr. F. Handley Page (Aeroplanes). The Hon. Mrs. Forbes Sempill was in the Chair.

Introducing the speakers Mrs. Sempill said that they were both famous experts in the world of aeronautics and if the debate between them had been open to the public, the Forum Club would not have been large enough to hold all those who would have wished to attend. Mr. Handley Page was one of the greatest authorities on what was termed heavier-than-air craft and Commander Burney was a very distinguished naval officer who had latterly become a politician. He was the inventor of the paravane which, during the War had saved hundreds of thousands of tons of shipping. Since then he had become the great protagonist of airships.

Mr. Handley Page was one of the pillars of the British Aircraft Industry. He was the President of the Society of British Aircraft Constructors and the inventor of the slotted wing which bore his name and had added to the safety of flying. Two distinguished members of the audience were Mr. R. N. Chawla and his engineer who had just flown from India to England. They had proved that skill and endurance were qualities of Indian pilots but the speaker pointed out that one swallow did not make a summer.

COMMANDER SIR DENISTOUN BURNEY, who opened the Debate, said that he was not a protagonist of airships because he admired their shape or because he liked their size. The fundamental consideration of air transport was Imperial communications. About 300 years ago this island had begun to assume world importance. Babylon, Egypt, Rome and Great Britain were the only four great Empires over hundreds of years. [What about the Spanish Empire, and the Moorish Empire, and Genghiz Khan's Empire, and the Great Moghul Empire and the Chinese Empire and the Russian Empire?—C. G. G.]

Two things had transferred the power from one Empire to another, the transport of goods by water, which only cost 1/40th of the cost of transporting goods by land, and the importation of an invention from China known as the Mariners' Compass which had given the world for the first time the ability to traverse the seas out of sight of land. These had led to the discovery of the Americas.

Great Britain had become the centre of the World not because of any intelligence of its people but because these discoveries had made it the geographical centre of the world. There had been a stream of merchant traders and venturers who set forth without Government interference. We had brought peace and prosperity to India, civilisation to Africa, and we had been to Canada. The great wealth arising in America had resulted in an economic capacity which was developing a market of continental dimensions which made it impossible for us to compete with them. Our market was our Empire which was separated in bits all over the world. If we were to develop an economic and political entity we must draw the Empire together.

No part of the British Empire was more than 400 miles away in railway cost. We must have some vehicle to cover the huge distances. The nearest point of the Empire was 1,500 miles away. The commercial range of a seaplane which was only 1,250 miles could not reach out to the Americas. The land aeroplane was a sorrier picture. With a range of 1,400 miles it had a pay load of about 4 tons.

Within the next five years the airship with a range of 5,000 to 7,000 miles and a speed of 90 m.p.h. would carry a pay load of from 30 to 50 tons. The airship was the only vehicle which could give the country to-day what the mariners' compass had given it in the past. It was the only vehicle which could stretch out to the Americas, and give a daily service from this country to every Dominion.

The heavier-than-aircraft could do great service but it was the airship that would link the focal points of any air transport service. The economic speed limit of the airship was 100 m.p.h. but the economic limit of the flying-boat was 150 m.p.h. There was no great future for aeroplanes. They must be small, say 20 tons, and at this size were bound to give violent movement to passengers and make them airsick. His wife was only one of those who thought that one hour's seasickness in a Channel boat was better than 2½ hours' airsickness in one of Mr. Handley Page's aeroplanes.

MR. F. HANDLEY PAGE said that he was the representative of an Industry for which there was apparently little hope. Commander Burney had drawn every kind of red herring across the track except airships versus aeroplanes. His historical references had been interesting but he had forgotten the Chinese Empires, the Indian Empires and the Empire in Leicester Square. According to Commander Burney this country was the centre of the world which was moving towards the North Pole. The problem of to-day was of maintaining communications and not of transporting crowds. The airship was not the only thing which could do 1,500 miles non-stop.

The airship had an optimistic speed of 70 m.p.h. The aeroplane was a real vehicle of transport when you were faced with a need for speed. He then quoted a number of extracts from Commander Burney's book which gave a very pessimistic outlook for airships.

Mr. Handley Page said that the country needed a period of economy and the question arose whether we were going to spend money on proved vehicles which had flown to all the Dominions and to America several times or whether we were going to spend it on experimental vehicles. The R.100 flying at 90 m.p.h. could carry no pay-load and the R.101 would not lift off the ground with full fuel or pay-load. Airships had been convicted out of the mouths of their own supporters.

The aeroplane had £300,000 a year subsidy for a thing which was actually in being but the airship had cost two million pounds in the past two years for something which was still experimental. Unless you could show a maximum speed of 120 m.p.h. you were up against adverse meteorological conditions. In these days of International friendship we needed an aerodrome in every country. We did not want to float about the clouds like an airship but to get down on the ground and make friends.

COMMANDER BURNEY said that he was not surprised at Mr. Handley Page's speech, which showed the usual lack of concentration noticeable in exponents of aeroplanes. The 1,500 miles to which he had referred was the minimum not the maximum. Mr. Handley Page had called him a politician but had poached on the politician's preserves by selecting passages from a book without quoting the context. There was a reply to each passage a few pages further on.

Airships had no market, but Mr. Handley Page having something to sell could leave out the defects of his goods. The short range of aeroplanes forced them to land in foreign territory. He believed that the great Air Mail to India now went as far as Athens by train (laughter). The problem was how to reach the Americas and the Dominions.

An airship with a cruising speed of 90 m.p.h. and a range of 5,000 miles was faster than an aeroplane with a cruising speed of 120 m.p.h. and a range of 1,250 miles. Aeroplanes had such short range that Mr. Handley Page had never studied meteorology. Storms only covered a certain area and if you had the necessary range you could go to the right side of the storm and take advantage of it.

The Airship Development Staff had for several years been plotting an imaginary airship crossing the Atlantic at 85 m.p.h. and in no case had it failed to cross. It was a confusion of thought that imagined that short range and high speed was a faster method of transport than long range and low speed. Air traffic to India was practically non-existent and there were only about five passengers a week on the Indian air route. He hoped Mr. Handley Page would afford a guinea and buy his book and read it all.

MR. R. N. CHAWLA said that no words could express the gratitude that he and his companion felt at the reception they had received in this country. They had greatly enjoyed the Discussion although they were not qualified to discuss the problem of lighter-than-air versus heavier than-air craft because they only knew one 'plane, the Gipsy-Moth. All the way from India they had seen the slot sticking out and they had been surprised not to have seen every push-bike fitted with slots in England (laughter). Their experiences had been very ordinary and they had always managed to find a field for forced landings.

LORD RUSSELL (Under-Secretary of State for India) said that the India Office were proud of Mr. Chawla and his companion on their achievement, which was being recognised by the Government of India.

MR. F. L. G. BERTRAM (Deputy Director of Civil Aviation) said that neither aeroplane nor airship could live without fuel. At present it was possible to re-fuel on the route to Australia but not on the route to Canada. Both kinds of aircraft had their own functions.

LIEUT.-COL. H. W. S. OUTRAM (Director of Aeronautical Inspection) said that the worst of inspecting airships was that they took so long to build that the inspectors developed an affection for them and would not pass them out (laughter). There was no reason to believe that there would be any difficulty in inspecting them for maintenance. Airships were very comfortable for passengers.

He personally was always sick in the cabin of an aeroplane and if he sat with the pilot there was very little room for the pilot. The aeroplane was very little ahead in speed. Only last year he had been travelling in an "air-liner" and motor-cars had passed them on the road beneath. The commercialities were bound up in the ultimate life of the craft and although lots of aeroplanes were coming up for the seventh and eighth time for the renewal of their licences, there was no knowledge of the life of airships.

AIR VICE-MARSHAL SIR VYELL VYVYAN (Government representative on the Board of Imperial Airways) said that the airship was the most comfortable form of travelling in the world. It would undoubtedly be the way of crossing the Atlantic in the future. But a tremendous amount of money would have to be spent and we should not get it back for years. He thought that this country ought to sit tight on airships and let America and Germany go ahead for the present. The air mail to India only went to Cologne by train and not to Athens. Air lines were up against political trouble which did not affect merchant ships which could put into any port in any part of the world. The last two Indian mails had arrived punctually.

Peace was the same as war in that if your communications were better than the enemy's you had him cold. Communications were the life blood of commerce. He could not help thinking that if India were part of France or Germany there would have been a regular air line there seven years ago. The air line to India would be a commercial proposition as soon as there was a daily service there because there would be practically no increase in the cost of the ground organisation.

SIR ALAN COBHAM said that airships showed great possibilities for the future. Transport had never been a commercial proposition but always a development proposition.

CAPTAIN HAROLD BALFOUR asked what had been the successes of airships? One of their chief disadvantages was that you could not land when you wanted to. As for comfort, with thousands of cubic feet of gas most people would hesitate to light a cigarette.

MR. HANDLEY PAGE said that the airship exponents were enveloped in a haze of meteorology and astronomy. Apparently they did not want to arrive at a place but to go round and round it. In that case why not have an auto-giro. He had stood next to a gasometer and he had also been near a lot of storage petrol tanks and he had no wish to fly with both at the same time. Of course there was helium but with helium you lost a lot of the lift. Of course you could always put another bit in the middle of the airship (laughter).

The shortest way to America was through the British Empire and he hoped the first regular service would be promoted by this country whether it was by airship or aeroplane.

COLONEL THE MASTER OF SEMPILL thanked the speakers for a discussion which he said had been educational and in a palatable form. He congratulated the Aviation Group of the Forum Club for getting two such distinguished exponents of airships and aeroplanes to speak.

By some omission there was no vote of thanks proposed for the very charming and efficient "Chairman."—C. M. MCA.

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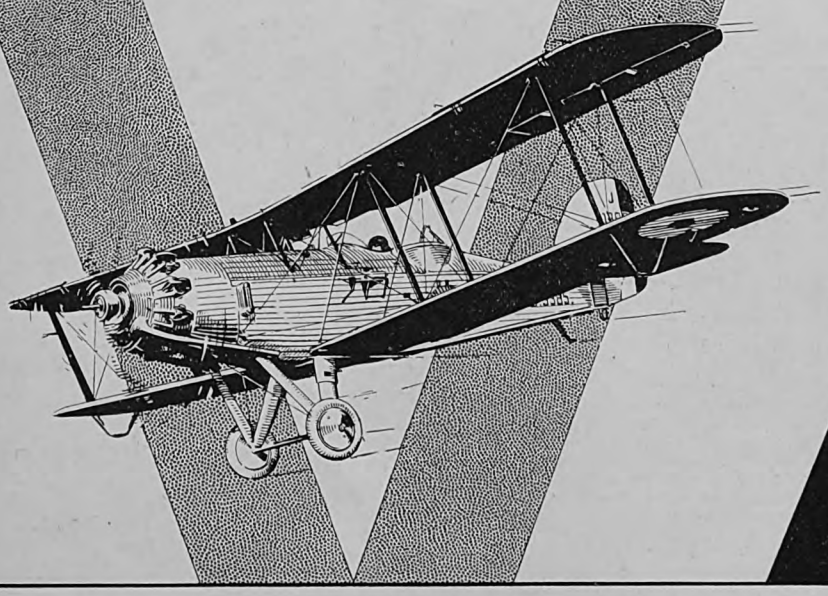

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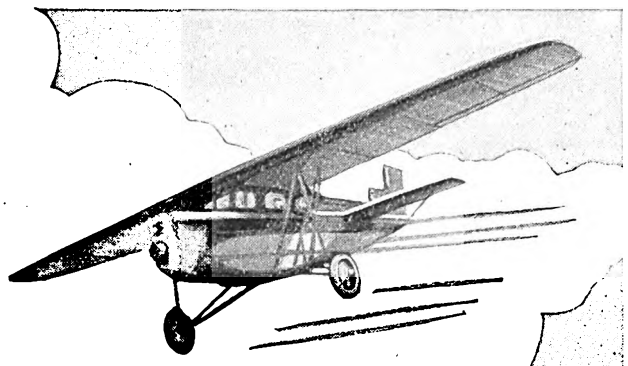

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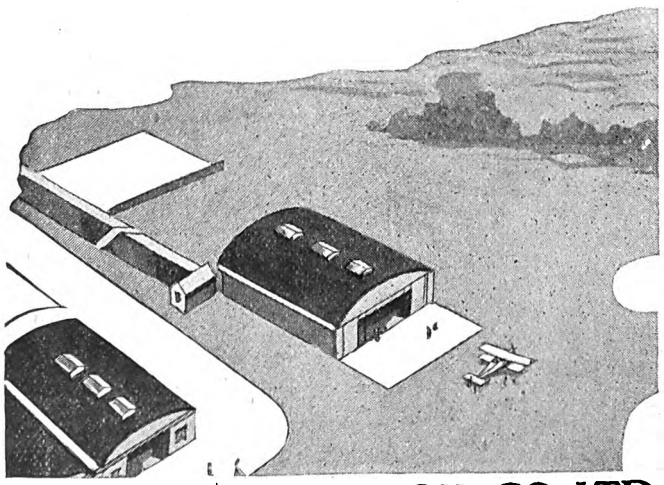

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

THE PARNHAM RALLY.

The Air Rally, organised by Miss Sicele O'Brien and Mr. L. G. Bentall, at the Parnham Country Club, Beaminster, Dorset, on Saturday last, was, from a spectacular point of view, very disappointing, but, on the other hand, the social side of the gathering was a complete success. A temporary aerodrome had been prepared on Toller Down, two miles from the Club. Parnham is the property of the son, now at Eton, of the late W. B. R. Moorhouse, who was the first officer of the R.F.C. to be awarded the Victoria Cross.

The first arrivals were Capt. Symondson, M.C., in his Gipsy-Moth AARU, followed by Sir Sefton Brancker in an N.F.S. Hermes-Desoutter AAPS. The official proceedings opened at 12.30 hrs. precisely, when Mr. A. C. M. Jackaman, in his Coupé Moth, dived across the finishing line to win the arrival competition, followed one second later by Mr. and Mrs. J. W. T. Chalmers's Gipsy-Moth. Flt. Lt. Rose was third.

During the following hour machines arrived at irregular intervals, until eighteen were lined up. This total was composed of ten common or garden Gipsy-Moths, one Coupé Moth (Bathroom tint), one Cirrus-Moth, one Gipsy-Bluebird, one Westland Widgeon, one Hermes-Desoutter, one Junkers Junior (Genet), and two Salmson-Klemms.

At 13.15 hrs. the centre of the social whirl was removed to the Great Hall of Parnham Manor, for lunch. After lunch Sir Sefton Brancker, in a short speech, pointed out the difficulty of fostering air-mindedness in Great Britain. It was, he said, much easier to demonstrate the advantages of air-travel over large continents, such as Africa or the United States, where it is possible to cover great distances by air. Nevertheless, he was of the opinion that British pilots led the World in sporting events, and that this will do much to promote the right spirit.

At 14.45 hrs. an attempt was made to resume the aerial programme, but unfortunately rain, which had threatened during the morning, had now blotted out the landscape. Anway, Mr. J. Hunter's Klemm appeared over the golf links adjoining Parnham Manor, to give a demonstration of slow flying to the large crowd of hedge-ticket holders assembled thereon. This demonstration was marred from a spectacular point of view because the pilot was obliged to aviate at a respectable height to avoid the numerous tall trees which surround the estate, coupled with bad visibility.

The next item was a display of aerobatics by Flt. Lt. T. Rose, with a Gipsy-Moth. He delighted the assembly with a game of hide-and-seek among the trees.

The bombing competition was delayed by the mysterious disappearance of the "bombs," but the programme proceeded with a polished display of aerobatics by Capt. Symondson in his Gipsy-Moth, and a very pleasing demonstration of the Westland Widgeon by Capt. Brunton.

At this point the "bombs" were found, but it was decided not to hold a serious competition, but merely to give a demonstration. The "bombs," by the way, had to be considerably modified before use, as, in their original form, they were composed of eight pounds of flour, tightly bound in strong paper bags, and were to be released at a height of not less than 200 ft., the objective being a Fordson tractor.

Owing to the tractor driver not being supplied with a tin hat the pilots concerned objected, quite rightly, to running the risk of a trial for first degree murder. Capt. Symondson and Flt. Lt. Rose each released three bombs, but no direct hits were achieved, although Flt. Lt. Rose scored an "outer."

The outdoor activity then ceased, but there were sounds of revelry by night at the Manor until a late hour. The visiting pilots included Capt. Symondson, M.C., Capt. C. D. Barnard, Flt. Lt. T. Rose, Capt. Brunton, Mr A. C. M. Jackaman, Mrs. Cleaver, Mr. G. Linnell, Mr. J. W. T. Chalmers, Mr. Rogers, Mr. Clarke, Mr. P. Tyzack, Mr. C. B. Hunter, Mr. K. Whittome, Mr. W. W. Straight, Mr. J. L. Shand, and Mr. J. C. Watson. There was also present a notable gathering of West Country Society, including Mrs. Moorhouse, who presented the prizes.—A. H. L.

AN INSPIRATION FROM NORWICH.

The notoriously lively spirit of the Norfolk and Norwich Aero Club has burst out in a fresh place, and offers to include the licensed members of other clubs in the fruits of its inspiration.

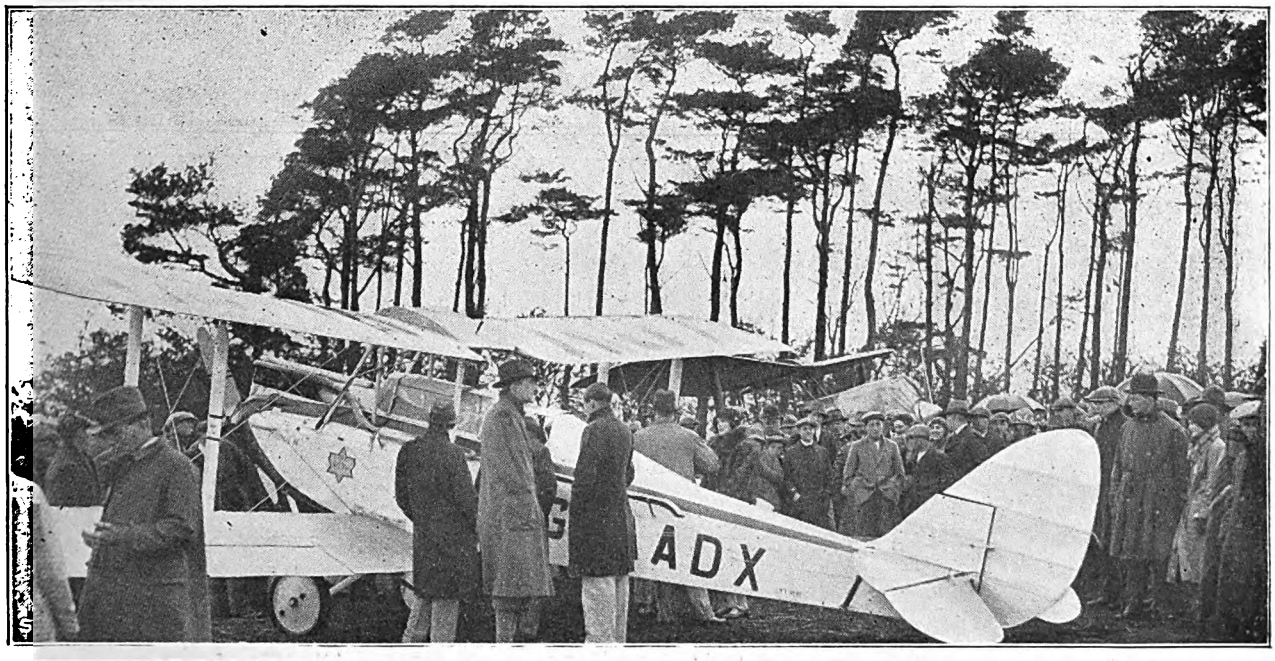
On Saturday, May 24, an Aerial Cross-Country Observation Competition will be held at Norwich, and licensed pilot-members of other clubs are invited to take part for a fee of three shillings and sixpence, which includes membership of the Norwich Club for the day.

Competitors will receive a map on which six landmarks are marked by circles. Their task is to find each landmark, drop a message bag as near as possible, both to it and to the zero hour for that particular mark, and describe each one after finishing the course Flying below 300 ft. will not be allowed, and zero hours will be determined by calculating on an average speed over the course of 60 m.p.h.

The first prize will be a cup, the second a tankard engraved with the Club crest, and another prize has been put up by Mr. J. Rossi for the Norwich Club member who makes the best showing. "B" licence pilots and Norwich Club members will be handicapped.

This is a sporting proposition of the finest water and has elements of practical airmanship in it which are not often found in aerial competitions.

The Norfolk and Norwich Club had rather bad weather during April, which held up progress in instruction and solo flying. The monthly Flying and Landing competitions for the Alexander Duckham Challenge Cups had twice to be postponed. But the spirit of the Club does not seem to be broken.



AT PARNHAM.—Mr. Jackaman's Coupé Moth (Gipsy) and some of the soaked spectators.

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A GOOD DAY AT SHERBURN

The Yorkshire Aeroplane Club, now one of the National Flying Services' chain, celebrated its fifth year of activity by a successful meeting at Sherburn-in-Elmet on Saturday, May 10. The meeting was better favoured with weather than most of the other flying events have been this season, and a crowd estimated at about 20,000 people attended.

The feature of the day was the race for private owners over a triangular 30-mile course, and the handicapping was really good. All entrants but one flew Gipsy Moths,—the exception was Miss Winifred Brown, of Manchester, who flew her Cirrus-Avian. She was given the maximum allowance of 2 min. 42 sec., and nearly won the race.

After holding a lead for two laps, Miss Brown was overtaken by Mr. Ivor W. H. Thomson, of York, whose average speed was 101 m.p.h. He flew Mr. G. Mallinson's Moth. Lady Bailey, who had flown up to the meeting, and subsequently flew back to London, took third place after averaging 98 m.p.h. over the course. Messrs. G. Ambler, of Bradford, and A. C. Pollock, of Huddersfield, were the other competitors.

Mr. R. R. Bentley, flying the Shell-Mex Hermes-Moth, G-AAIM, won the balloon-bursting competition. The All-Forms-of-Transport race, after the usual amateurish and undignified struggle with vehicles and quadrupeds of uniformly low safety-factor, was won by Mr. Thomson.

Flt.-Lt. H. M. Schofield gave his now well-known display of aerobatics in a Desoutter monoplane, and proved that its undoubted comfort is combined with an ease of control which allows the pilot to be quite uncomfortable if he wants to. And Mr. Bentley, who is developing a decided leaning to crazy-flying, leaned ostentatiously against nothing all over the countryside to the great delight of all spectators who were not underneath him.

Mr. John Tranum has got into his stride again. After being prevented from making his parachute descent on two or three occasions recently he bailed out of a Moth in satisfactory style at Sherburn and landed, as usual, right side up and ready for tea.

The Comper Swift, piloted by Mr. L. S. Snaith, was a feature of particular interest to those present.—F. D. B.

READY FOR DOINGS AT BROOKLANDS.

The Brooklands School of Flying has its preparations well under way for its Pageant on May 17, when the Brooklands Aero Club will be opened officially.

All private owners have been invited by card, and the management has requested an answer from those who wish to attend, with the approximate time they expect to arrive.

Visitors are urged, moreover, to come before 2 p.m. so that the programme may be run off on time, and without the anxiety attendant on unannounced arrivals when the air is full of machines whose pilots have their attention occupied by exigencies of the display. These displays are excellent for aviation—if nothing untoward occurs. The paying crowd, which helps to make them possible, are entitled to be given a show, and this is not possible unless pilots have the run of the air during their turns.

The programme is one of the most varied and ambitious of the season so far, and includes such pilots as Flt. Lt. T. Rose, Lt.-Col. G. L. Henderson, Messrs. Sidney St. Barbe, Dudley Watt, H. S. Broad, G. Lowdell, E. A. Jones, S. A. Thorn, and Clark. The different types of aeroplane present will include, besides the usual popular light aeroplanes, the Comper Swift, the Southern Martlet, the Autogiro, the D.W.2 Trainer, the Junkers Junior, the Klemm and the Hawker Hornet.

AT SHERBURN.—Lt.-Col. Ivo A. Edwards, Lady Bailey, Lord Brotherton of Wakefield, President of the Yorkshire Club, and Mr. W. K. Gill, Chairman.

THE AGA KHAN'S PRIZE.

Two young men of Asiatic ancestry and adventurous temper landed in quick succession at Karachi during the past week-end.

First, on Saturday afternoon, May 10, at 13.00 hours, came Mr. Man Mohan Singh, a student of Bristol University, who had started on Apr. 8 to win the Aga Khan's prize for the first solo flight between England and India by an Indian.

On Sunday, May 11, at 15.30 hours, Mr. "Engineer" landed, and as his flight took him less than the prescribed maximum time of four weeks he would appear to have won the Aga Khan's £500.

Mr. Singh's third attempt for the prize was nearly as replete with adventures as his previous two, and he landed some forty miles from Karachi on Friday owing to shortage of petrol. His vicissitudes did not end with the arrival, as he was immediately garlanded by local notables, and threats of formal addresses of welcome seem likely to materialise.

Mr. "Engineer's" flight was, by contrast, uneventful. His one unpremeditated landing was in the Arabian Desert, where he lost his way and his oil pressure within a few minutes. On landing he found the air pressure in one of his tyres also non-existent, but after sleeping under the machine for a night he stuffed the tyres with clothes and continued.

Mr. Jehangir R. D. Tata arrived at Croydon aerodrome at 12.16 hours on Monday, May 12,—less than a day too late to win the Aga Khan's prize, which is for the first flight and not for the fastest, although a time limit of four weeks was imposed.

A WARNING ABOUT BRISTOL

On Saturday, May 31, the Bristol Municipal Airport will be opened officially with a Pageant under the auspices of the Bristol and Wessex Aeroplane Club. The Club will be assisted by the R.A.F. with a display on Service machines.

The organisers of the Bristol Meeting have recognised

A WORK OF SUPEREROGATION.—The Comper Swift, which was flown at the Sherburn meeting by Mr. L. S. Snaith, surrounded by St. John's Ambulance men, whose professional services were not in demand.

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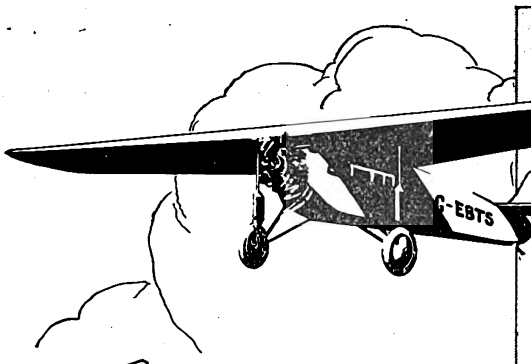

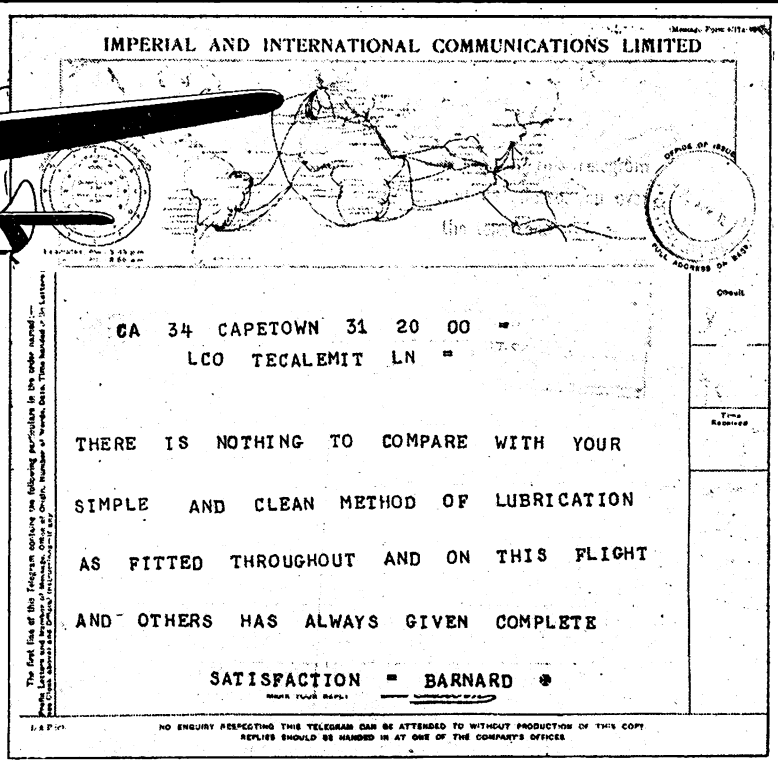

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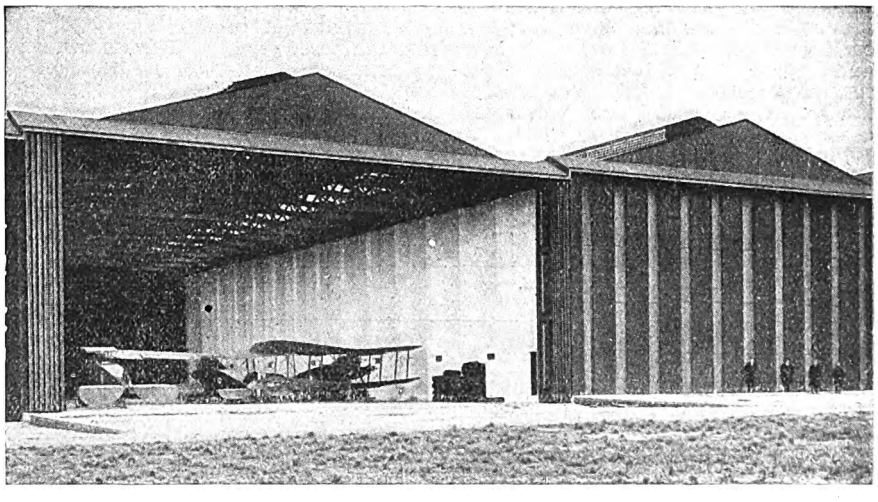

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the growing danger of "more or less" control of air traffic on these occasions, when really big gatherings of aircraft are expected. The regulations and instructions to visiting pilots are already issued and are printed hereunder, as well worthy of attention in the interest of the general safety.

Competitors must be at the airport by midday on Friday, May 30, and they will be furnished with full information and instructions. Visiting pilots, which means those who will not arrive at Bristol until the day of the Pageant, are asked to acquaint themselves with the aerodrome rules for that day.

Safety can only be ensured by adherence to the rules issued, and then only if *all* pilots conform to them. As the best system can only be evolved by experiment it is in the interest of all who travel by air to aid and abet the efforts of the Bristol Club to be wise in time, before the sky becomes dangerously crowded.

We of THE AEROPLANE will co-operate to the best of our ability with the promoters and managers of the meeting. If any aviator offends against the regulations the fullest possible publicity will be given to his or her offence, so that, the entries of such pilloried offenders may be refused at future meetings, and so that employers of pilots may be warned against employing people whose flying is a danger to the public and a menace to the popularising of aviation.

The regulations read as follows:—

INSTRUCTIONS TO VISITING PILOTS.

1. It is essential that visiting pilots arrive at the Airport before 2 p.m. After this time arrivals will seriously interfere with the Flying Programme.

2. The greatest care should be taken when approaching on arrival, as from 10 a.m. onwards heats of races, joy-riding and exhibition flights, etc., will be in progress.

REPORTING.

3. Immediately on landing each pilot *must* report to the Flying Control Tent, situated at the Eastern side of the Aerodrome, where he will receive instructions re parking, etc.

Throughout the day no pilot will be allowed to take off without the permission of the Flying Control official.

GENERAL.

Left hand circuits must be rigidly observed.

No unauthorised stunting will be permitted.

Flying gaps will be arranged so that approach to the aerodrome is possible from any direction without flying over an enclosure.

Pilots are particularly requested not to land or take off across wind.

In the event of there being no wind the direction of landing will be indicated by a T.

Note.—Competitors are reminded that it is essential for them to arrive by midday Friday.

All Competitors and Visitors by Air will be under the Control of the Promoters.

The Bristol Municipal Airport is the property of the Corporation and is controlled by the Airport Committee of the Council. The Management Committee also includes representatives from the Bristol and Wessex Aeroplane Club, whose permanent staff act at aerodrome officials.

The Corporation purchased and prepared the land, provided necessary facilities, and are the proprietors of the airport. Showrooms, aerodrome facilities and privileges are available for rent to private companies who wish to conduct sales, operation or taxi-services from the aerodrome, and adjoining land has been reserved for potential expansion of aircraft manufacturing, etc., for which Bristol, with its convenient Bristol and Avonmouth Ocean Docks, seems especially suitable.

The Bristol and Wessex Club provides flying tuition and the usual club services, and their preparations for the event on May 31 speaks well for the soundness of their organisation.

By early application to the Manager, Bristol Airport, intending visitors may book accommodation for Friday and Saturday nights at reduced rates.

SPOON-FEEDING AN INDUSTRY.

The French Air Ministry has decided to organise a light aeroplane competition to be known as the *Concours Technique National d'Avions de Tourisme.*

This contest will be held in October, 1930, and the total prize list will amount to 2,000,000 francs (approximately £16,000).

This competition together with the proposed Government subsidy of 5,000,000 francs (approximately £40,000) for private owners of light aircraft, the conditions of which have been published in the *Journal Officiel* and were also given in THE AEROPLANE for Apr. 23, and the provision of a prize list amounting to 200,000 francs (approximately £1,600) for the French competitors in the *Challenge Internationale de Tourisme,* represents the effort of M. Laurent-Eynac, the French Air Minister, to encourage the production of light aeroplanes and the development of "air-mindedness" in France.

Hitherto the French Industry has not considered the production of light aircraft in quantity worth while without an apparent clientele, and this clientele has not developed because of a lack of suitable economical touring aircraft.

There will be interest in seeing whether an aeroplane designed and built to beat the rules of a competition will provide the best facilities for the budding French private owner.

TO OUR GERMAN FRIENDS.

The following letter is from one of those who enjoyed the Heston Easter Tour:—

Sir,—I should be glad if you would allow me to make public acknowledgment of two pleasing acts of courtesy that befell me after a forced landing in my Klemm-Siemens during the recent Heston tour.

The landing was necessitated by the sudden stripping of teeth from a pinion mounted on the crank-shaft and driving the two magnetos. Thanks to the remarkable gliding angle of the Klemm, and to the skill of Dr. E. D. Whitehead-Reid, who was my companion on this occasion, the landing was carried out in difficult country without the slightest damage, but it was obvious that we could not proceed.

On hearing this, however, Herr Klemm immediately sent a second machine to meet us at Vienna (where we arrived by train next day) and this machine was placed at our disposal, free of charge, for the homeward journey, with the result that we arrived with the rest of the party. My own machine, equipped with a brand-new engine, also supplied without charge, followed a week later.

To add to this I received an intimation from Captain Lamplugh (against whose group no claim was either valid or even dreamed of) that he would be pleased to reimburse me for the expenses involved in getting my machine back from the place of its forced landing to the Klemm works near Stuttgart.

My flying experience is short, and such incidents as these may not be unusual in a profession in which war-time traditions of courtesy so obviously persist. To me, however, they appear sufficiently striking to warrant this letter.

(Signed) R. P. G. DENMAN.

SODA TO THE RESCUE.

Private owners will shortly have new and better facilities at Le Bourgêt,—according to advices received by the De Havilland Aircraft Co. Ltd. from the *Société pour le Developpment de l'Aviation,* hereinafter designated, for brevity, in the Continentally popular cryptographic manner, as Soda.

The essence and spirit of Soda's communication is that it is establishing a filling station where visiting owners of private aircraft may exercise a choice of several varieties of *essence,* to wit: Aviation Spirit, Benzol, or No. 1 petrol.

Mechanics will also be available for running repairs, checking and cleaning, at lowest possible charges.

THE LATEST WATER-FLIER.—The Puss-Moth (Moth III) with inverted Gipsy engine on the Welsh Harp at Hendon. —(*"Aeroplane" photograph.*)

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February, 1930.

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FOR THE KING'S CUP.

In view of the fact that Moths are continually changing hands, the De Havilland Aircraft C. Ltd. cannot keep a record of every owner, and consequently notifications cannot be communicated by direct circularisation. The Company therefore desires to draw the attention, through the columns of THE AEROPLANE, of those Moth owners who wish to enter for the King's Cup Race, to be held on July 5, to the necessity of communicating immediately with the Company in the event of their requiring special work done or equipment supplied.

Immediate notice is especially necessary in the case of special airscrews to prevent the engine of a cleaned up machine from over-revving. These take a fortnight to manufacture.

All communications on this subject should be addressed to Mr. H. Buckingham, The De Havilland Aircraft Co. Ltd., Stag Lane Aerodrome, Edgware, Middlesex.

WITHDRAWN FROM COMPETITION.

Canadian pilots will not hereafter hold speed contests with the national bird, with or without the consent of the latter. In other words there is a close season during which one may not, if in charge of aircraft, indulge in the chase of the wild goose. Mr. Philip Osler, a well-known member member of the Winnipeg Flying Club, and hitherto of good report, has been haled into the Courts of Justice and mulcted in the sum of $10 and costs for that he did fly in an aeroplane at and/or with and/or after certain wild geese between the towns of Rosser and Meadows in the province of Manitoba, thereby disturbing the peace of thousands of the birds which are entitled at this season to respite from disturbance, even from being shot.

Mr. Osler gave an undertaking to do so no more, and also to advise and urge his fellow members to refrain likewise.

[From personal acquaintance with those, one's own erstwhile co-miscreants, one's earnest sympathy is extended to Phil in his evangelistic endeavours,—and to the geese, in the hope that they may get a chance to increase and multiply without a Gipsy or Cirrus accompaniment.—F. D. B.]

GLIDING.

The First Air Train.

On April 6 Captain Frank Hawks, the famous American non-stop trans-Continental pilot, landed his enclosed-cabin glider, the *Eaglet*, in the Van Cortlandt Park, New York. He had been towed the 2,400 miles across the continent from San Diego, California, behind an aeroplane, and made the trip in eight days. At each important aerodrome on the way across he cut loose and gave a display of gliding.

A report states that Capt. Hawks was in telephonic communication with the pilot of the towing aircraft. The glider was also equipped with a radio set to while away the monotony.

The feat demonstrates the possibility of towing gliders for the distribution of mail or passenger along a trunk route without forcing a landing of the express machine. Mr. Raab (or Mr. Katzenstein) discussed the idea of aerial "slip-coaches" quite seriously at Geneva a year ago.

The First Training Glider Accident

The first crash to a training glider in this country which resulted in personal injury occurred at Oxton, Nottingham, on May 11, when Mr. S. A. Currin broke a leg. Apparently the glider was pulled off pretty strongly and allowed to climb steeply enough for the wind to blow it back into the ground.

The Winchester Gliding Club.

A public meeting will be held at the Abbey House, Winchester, on May 20 at 19.00 hrs. to inaugurate the Winchester Gliding Club. The Mayor of Winchester will be in the Chair, and the speakers will be Air Vice-Marshal Sir Sefton Brancker, the Director of Civil Aviation and President of the British Gliding Association; Group-Captain C. H. K. Edmunds, the officer commanding Worthy Down Aerodrome; Mr. Gordon England, and Mr. Howard Flanders.

The ordinary subscription to the Club is one guinea per annum, for associate or non-gliding members half-a-guinea per annum, the entrance fee for both classes of membership is ten shillings. There will be a special scale for serving members of local R.A.F. Units.

Further particulars may be obtained from the Hon. Secretary, Mr. Walter Russell, Fordington Road, Winchester.

Nottingham Gliders.

The first meeting of the Nottingham Gliding Club was held on April 12; the Committee announced that the machine which has been bought would be delivered within a week or so and that training would immediately begin at Oxton, where a suitable ground has been secured.

There was a good attendance, including several ladies, and Mr. S. A. Currin, who was elected President, gave an interesting survey of the history of gliding.

The following Committee was elected: Messrs. S. A. Currin, M. A. Logelain, A. M. P. Edwards, A. L. Redfern, L. F. Johnson (Hon. Sec.), R. S. Campbell and H. B. Whitby (Hon. Treas.).—G. S. G.

The North Cotswold Gliding Club.

On April 10 the Inaugural Meeting of the North Cotswold Gliding Club was held at the Montford Café in Evesham. Mr. J. Whitehouse was in the chair.

Mr. Wright said the Club had ordered their own glider and that arrangements had been made for a gliding ground. The Club would have to spend about £20 on the improvement of this land, such as the removal of a brick wall. Mr. Alan Butler, of the De Havilland Company, had offered the Club the use of his hangar and field and Mr. Cotterell the use of his land.

The entrance fee and subscription had been temporarily fixed at 10s. 6d. and £1 1s. The meeting adopted the Rules of the London Gliding Club with slight alterations. Mr. J. Whitehouse was elected chairman and hon. treasurer, Mr. Horace Wright was elected hon. secretary. These, together with six other members, who were elected, form the management committee of the Club. Mr. Nyborg, a member of this committee, after the meeting presented the Club with £10.

Gliding in Belgium.

In Belgium, as in other countries, there is a revival of interest in gliding. Quite recently demonstrations were given by Wolf Hirth, a famous German "sailflyer." The Belgium Ministry of Transport have arranged for six pupil-pilots to attend a gliding course at the Rhoen from April 2 to April 26.

On their return these six pilots will form a nucleus from which an organisation can be set up to train the Belgian "young idea."

The Royal Belgian Aero Club have made arrangements to receive from the Rhoen Rossitten A.G. complete plans and specifications of the Zogling-type primary training glider. These drawings will not be sold but will be available to the various gliding clubs.

Why Glide?

Sir,—Having been troubled a good deal of late by those admirable people who have nothing to give but advice, I shall be very grateful if you would permit me to try to clarify their mystic outlook, to some extent

In short, some hundred or so of our forty-eight million inhabitants are trying to get the gliding movement going in the British Isles, and to some extent they have succeeded. But in being connected with this effort I am continually meeting with people who persist in talking at me re gliding. These people are under two categories: (A) people of irreproachable position in the aircraft trade, whose experience is so vast that they can only think one way at once, and (B) persons, whose sole claims to human society are about three hours' solo and size fourteen hats!

These folks say, why don't you soar? What on earth do you think there is in hopping about? Oh yes! We HEAR about huge Continental records, but still, you know . . . .

Or else certain others talk about what they did in '22.

Will they realise that ground has to be found and sanctioned—and London people will NOT go to Eastbourne to glide—that sail-planes have to be bought by someone, and that experience is necessary to fly them.

Will they buy gliders for us, and give us ground to glide on? They have not been asked to glide.

The gliding which is now taking place is being done because various people wished to glide, clubs have been formed, and they are gliding. And, it is THEIR business.

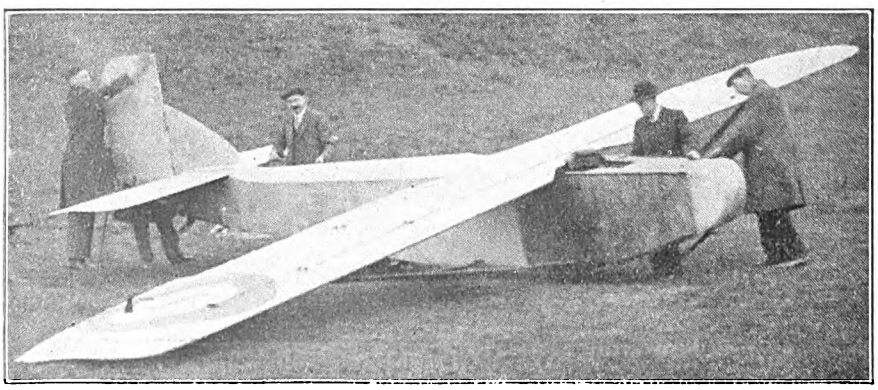
(Signed) STANLEY BRADSHAW,
Hon. Treasurer, London Gliding Club.

The Midland Intermediate Glider.

The Midland Glider Club have obtained permission from Mr. Davies of The Clive Farm, Pattingham, to use some of his land as a gliding ground and to erect hangars on it, entirely free of charge to the Club. The ground is a ridge some three miles' long. The Club state that a southerly wind with a velocity of 20 m.p.hr. will give up-currents of over 5 ft. per sec.

The Club have an intermediate type glider, which is a braced high-wing monoplane. The fuselage, unlike the German machines of this type, such as the Prüfling, is close against the wing. The Club state that their glider has a gliding angle of 15 : 1 and a flying speed of 30 m.p.h. This gives a sinking speed of nearly 3 ft. per sec.

The Club worked hard during the bad weather at Easter on their first hangar, which has a span of 38 feet and a depth of 28 feet.



THE FIRST BRITISH SECONDARY GLIDER.—The intermediate glider of the Midland Glider Club, which has a sinking speed of about 3 ft. per sec.

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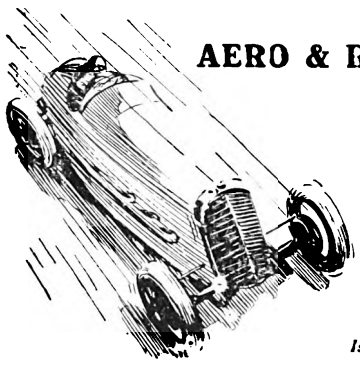

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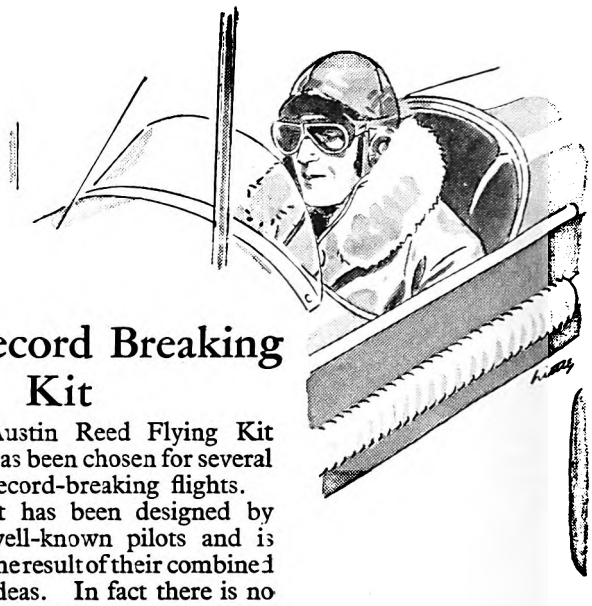

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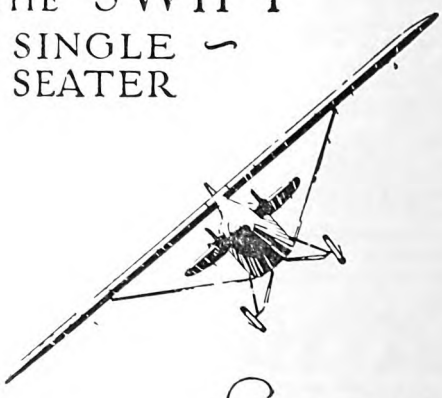

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COMMERCIAL AERONAUTICS.

CENTRAL AMERICAN AVIATION.

Aviation in Central American States and Republics, is, at the time of writing, in a fairly healthy state of being. By aviation one does not mean the construction of aircraft, but merely the successful operation of mail and passenger-carrying air-lines, together with a few odd instances of aerial warfare, which will be referred to later.

On my journey here I stayed at Port-of-Spain, Trinidad, for a fortnight, and on the day after my arrival, Sept. 22, the first U.S.—West Indies air-mail plane, a twin-engined Sikorsky flying-boat, arrived there, piloted by Col. Lindbergh, with his wife as passenger. Of course, as soon as Lindbergh appeared outside the Customs, the native population got out of hand, and mobbed him. This made him so wild, that, as a reprisal, he refused to attend a reception in his honour, that had been arranged at the Union Club, and drove instead to Government House. Until he did eventually go to the Club on the following Wednesday the feelings of the white colony were pretty high.

The most important air transport company is the Pan-American Airways Inc., whose ramifications extend from Florida, in the United States, to the Andes of South America, embracing both the Pacific and Atlantic coasts of the latter country, and the more important West Indian islands. It consists of a main, or all-red route, from Miami to Porto Rico, with numerous feeder and branch lines. Among these latter may be mentioned a line linking up Guatemala City and San Salvador with Managua City, Nicaragua, on the main line, which has been recently inaugurated.

Also, on Mar. 1, 1930, a further extension was opened to the public, from the Panama Canal Zone, along the north coast of South America, by way of Maracaibo, to Port-of-Spain, Trinidad. Here it may be noted that an air-mail letter for an address in the British Isles, posted in Trinidad, and sent by way of Panama, Miami, and New York, would arrive at its destination about 4 or 5 days before an ordinary boat-mail letter, posted at the same time, and coming direct from Trinidad to Plymouth.

A subsidiary of the P.A.A. is the Mexican Aviation Co., whose activities consist in linking up the 28 states of Mexico with the United States. This company does a very good business in week-end trippers from the States, who visit Mexico, ostensibly for sight-seeing and horse-racing, but of course there is no such thing as Prohibition in Mexico.

Mexico incidentally, occupies second place on the American Continent, and fifth place in the whole world, in the development of airways. In addition to this she has a number of first-class pilots. Col. Sidar, to mention only one, will be remembered for his "goodwill flight" from Mexico City to Buenos Aires and back. Unfortunately Col. Sidar was killed on May 12 in attempting a non-stop flight from Mexico City to Buenos Aires.

The machines used by this company are all tri-motor, all-metal Ford tri-motors equipped with radio, ice-water, etc., and the usual conveniences for the comfort of the passengers. They carry a crew of four, consisting of pilot, relief pilot, radio operator and mechanic. The P.A.A. also use this type, in addition to the smaller twin-engined Sikorsky amphibians, which are used chiefly on the coastal routes.

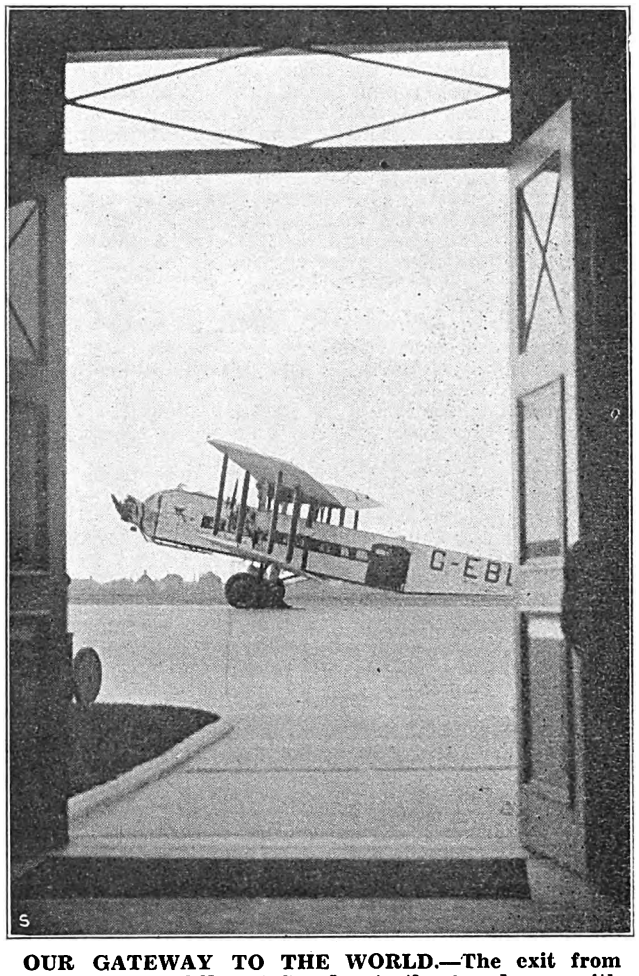
Other concerns include Isthmian Airways Inc., operating on the Panama Canal Zone, from Cristobal and Colon, on the Atlantic side, to Balboa and Panama City, on the Pacific side. This line brings these important cities within a few minutes of each other. Hamilton all-metal seaplanes are used. The company has authority to alight anywhere along the Canal, if desired.

Then there is Scadta (or, in full, the Sociedad Colombo-Alemana de Transportes Aéreos), with its sister concern, Cosada (Companie Santandereana de Aviación), both of which operate in Colombia and Ecuador.

The Scadta Company was founded in 1919, in Baranquilla, by a group of German business men, to organise an air service along the course of the Magdalena river. Junkers monoplanes on floats are used.

Next comes the Lloyd Aéro Boliviano, a company formed to link up the towns and cities of the Republic of Bolivia. This company uses Junkers *Bremen*-type machines, with 525 h.p. Pratt and Whitney Hornet engines.

Further East there is the French *Compagnie Générale Aéropostale*, whose chief function is the transportation of mails only, between Chile and Europe, by way of the South Atlantic and Dakar, North Africa. This company has been rather unfortunate, owing to the mails having been destroyed on several occasions by Arabs, after forced landings in North Africa. Once last year, between July 20 and August 3, the mails were lost on three consecutive occasions.



OUR GATEWAY TO THE WORLD.—The exit from the Passenger Office at Croydon to the Aerodrome, with an Armstrong Whitworth Argosy (three Jaguars) belonging to Imperial Airways Ltd., waiting on the apron.

As regards military activities, these are practically confined to the U.S. Navy and Marines. The largest aviation camp is at France Field, in the Panama Canal Zone, and is part of the scheme for the defence of the Canal. During the U.S. Naval manœuvres this Spring, which culminated with a mock attack on the Canal defences on Mar. 1, no fewer than 400 aircraft were flying over the Zone at one time. A large number of these were from the aircraft carriers *Saratoga* and *Lexington*.

The types seen included twin-motor Keystone Pirate bombers, Loening amphibians, Vought Corsairs, and Curtiss P.W.9s.

For almost real aerial warfare we must adjourn to the Republic of Nicaragua, where the U.S. Marines have a thorn in their side, in the form of the bandit, Pedron. Pedron was Sandino's right-hand man, during the trouble of 1927, and, unlike Sandino, did not leave the country when law and order were restored. Instead, he took unto himself about 200 well-armed and well-mounted men, and set up in business as a bandit, in the north of the Republic, near the Honduras frontier.

Bombing aeroplanes from Managua City daily scour this part, but owing to the dense bush, it is like looking for a needle in a hay-stack, and so, up to the time of writing, Pedron has gone his own sweet way, as a sort of will-o-the-wisp, making periodical forays, and generally making life worth living for the U.S. Marines.

The planes used are Douglas biplanes, Leoning amphibians and Vought Corsairs.

The two latter types also use the lake for alighting as well as gunnery practice. For gunnery they shoot the crocodiles with which the lake is infested. The natives afterwards collect the dead, which are valuable for their hides, providing, of course, that the .303s have not made leather sieves of them.—A. H. E.

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SCIENTIFIC PREPARATIONS IN CANADA.

Because Canada has probably more to gain from aeronautical development than almost any other country, and as the commercial extension of her territories is even now following the airways as it previously followed, first the rivers, then the railways, it is in a spirit of pure business enterprise that the National Research Council of Canada is establishing laboratories for aeronautical research.

The Council, in collaboration with the departments of Government directing Canadian commercial aviation, is already building National Aeronautical Research Laboratories in Ottawa that will enable Canadian scientists to discharge several functions that very properly belong within the Dominion. Suitable buildings have been bought by the Dominion Government and work is well advanced on a wind tunnel, a towing tank, and engine-testing equipment.

The wind tunnel will be nine feet in diameter, with a 13-foot airscrew to develop an air-stream of 125 m.p.h. and all the necessary instruments for controlling, checking and recording results. The towing tank, 400 ft. long, six feet deep and eight feet wide, will have an electric towing carriage with dynamometers which record its speed automatically by spaced electric contacts and a recording chronometer on shore. Apparatus is being provided to control the movement of the water and the surface dust, and the size is such as to allow experiments on models four feet long, giving 150 ft. for acceleration, the same distance for readings, and 100 ft. for deceleration.

The engine testing equipment will be adequate for power-plants up to 1,000 h.p. and has the unique feature of provision for applying thrusts up to 6,000 lbs. on the crank-shaft. For air-cooled engines an electric fan driven by a 250 h.p. electric motor will provide an air blast through adjustable nozzles.

The functions of the laboratory will be to conduct research for the improvement of aircraft performance with special reference to Canadian conditions and also to make tests for designers, manufacturers and operators. Among its duties will be training of men in aeronautical research.

There are at present three firms assembling aircraft engines in Canada for home use, and the export of these engines is already beginning. Under Canadian Air Regulations the Government is required to test such engines for airworthiness, but no equipment for doing so has yet been provided. This duty will be an important part of the work of the National Aeronautical Research Laboratories.

Prof J. H. Parkin, B.Sc., M.E., F.R.Ae.S., will be in charge of Aeronautical Research, and is Assistant Director of the Division of Physics in the National Research Council. Prof Parkin is responsible for the only other wind tunnel in Canada, that of the University of Toronto, which he proposed, designed and installed, when he was on the Physics staff. He interested the University authorities in aeronautical research in 1917.

Prof. Parkin has as assistant Mr. J. J. Green, who recently occupied himself on aeronautic and aerodynamic research under Prof. L. Bairstow.

A STEP FORWARD.

On Wednesday, May 7, another experiment was made in speeding-up trans-Atlantic mails by catapulting them from the deck of an East-bound liner. This, the first attempt of its kind involving British mail, was entirely German, for apparently such an idea has not yet penetrated the British marine mind,—in spite of Sir Alan Anderson's association with the Air League of the British Empire.

At 11.00 hours Capt. Studnitz took off in a Heinkel seaplane from the catapult on the upper deck of the Nord-Deutscher-Lloyd liner *Bremen*, which was then south-west of Ireland, and landed a bag of British mail at Southampton some hours later. After refuelling at the Imperial Airways seaplane station there, the monoplane took off for Amsterdam, whence the dozen bags of German mail were put on the train for Cologne. The British mail was about a day ahead of the ship and the German mail was between two and three days ahead.

Capt. Studnitz flew to Land's End by wireless bearings from the *Bremen* and states that the most difficult part of his trip was on the liner itself, when he had difficulty in reaching his machine through the crush of excited passengers.

[A nice question arises. Are people who are sending correspondence of high import, which is not in a hurry, entitled to mark their envelopes "Not To Be Catapulted"?—ED.]

THE LAST LINK IN THE SOUTH ATLANTIC.

As reported in THE AEROPLANE for May 7, the first batch of mail destined to be flown across the Atlantic left Marseilles on May 1 in a Latécoère 28 monoplane (600 h.p. Hispano-Suiza engine), with a float undercarriage, for Saint Louis, Sénégal, the jumping-off place for the crossing of the South Atlantic.

Additional mails were flown to Saint Louis by MM. Ember and Margillet, who arrived on May 12. M. Mermoz, the pilot of the Latécoère 28, who had been at Saint Louis since May 4, started on the same day on the long crossing of the Atlantic to Port Natal, in Brazil. Two messages were received from him. The first, at two in the afternoon, said all was well, and the second, two and a-half hours later, gave his position and stated that all was well.

AIR MAILS.

In the House of Commons on May 6, in reply to Commander Bellairs, the Postmaster-General said that for the year ending March 1930 the total payments to British and foreign air companies respectively for the air carriage of mails had been £54,000 and £2,300. He had no information regarding the relative payments to various companies made in the United States of America and Canada; but according to the latest figures available the total annual payments for the conveyance of mails by air were given as 11,169,015 dollars (£2,200,000 approx.) and 274,403 dollars (£55,000 approx.) respectively.

WYTHENSHAWE AGAIN.

Mr. J. F. Leeming, a director of Northern Air Lines, announces that this company will reopen the formerly temporary landing-ground at Wythenshawe which was in use before the Manchester City Airport was operating at Barton (otherwise Chat Moss). Northern Air Lines will still have headquarters at Barton, but intends to use Wythenshawe as a secondary landing-ground, a school for flying, and a base from which to operate air excursions to the Barton aerodrome and back.

This information is really amusing. The misguided Manchester Corporation have been spending tens of thousands of pounds trying to fill in enough of that insatiable bog called Chat Moss to make what they fondly imagine will be a Municipal Air Port,—in spite of the lesson they ought to have learned from the attempt to build a railway across it something over sixty years ago, an attempt which ended in the engineers *floating* the railway on faggots (or *fasces*) because there was seemingly no bottom to the bog.

Rumour has it that the Manchester City Fathers (or Grandmothers) insisted on having their aerodrome at Chat Moss simply because it is in Lancashire and Wythenshawe is in Cheshire, although Wythenshawe is nearly half an hour nearer the middle of Manchester, and is about the best aerodrome surface that could be imagined, and is actually Municipal property, and is on the South-West, or civilised, side of the City.

So now we have what ought to be the municipal aerodrome being used to run air-trips from the City to its Airport. Was there ever a funnier example of Bumbledom?—

C. G. G.

MANY INVENTIONS.

It is said that the first inkling of that unpleasant weapon the phonograph burst upon its inventor's brain when the voice of a raucous acquaintance caused his (the inventor's) top hat to vibrate upon his head. History does not relate that the inventor hurried home and placed the top hat, scored and furrowed as it doubtless was by his friend's vocal vibrations, beneath the needle of the ancestral sewing machine and thus produced the first Edison Bell Record, but doubtless something of the sort happened, for the early phonograph record was obviously modelled upon the "stove pipe hat."

Those of us who are opponents of too much music around the domestic hearth, may reflect that the silk hat may have had a sinister influence upon other World-devastating inventions.

Who shall say that the crystal set was not born in the brain of some alcoholically depressed genius returning from a funeral on a muggy autumn afternoon, in an Early Victorian, ill-ventilated top hat, slightly fungoid inside from long disuse, and therefore capable of throwing off the same soul-destroying vibrations as a stilton cheese in a state of senile decay?

Fit "TripleX" Regd -and be safe!
TRIPLEX TRADE MARK SLATE
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It is a grim thought that the crystal set, the B.B.C. and its Announcers, as well as the horrid "portable" which follows one from place to place howling dismally, were all perhaps due to the influence of the top hat,—a form of head covering which, it is well to remember, was particularly dear to Charlie Peace. That the hat may have played so important a part in the decline and fall of civilisation, brings us to the thought that other portions of the human attire may also have played their part.

Passing over the well-known fact that crazy paving and the more complicated cross-word puzzle patterns were suggested by the clothing of a well known bookmaker whose slogan was "Buggie never pays," we come to the little known story of the inspiration which resulted in the building of R.101.

A gentleman awaiting his lady-love for long hours outside a Lyons in Oxford bags, inadvertently stood over the kitchen grating. Hot air filled his trouserings and just as the fair one arrived he departed, vertically and unwillingly. Circling Gwydyr House with a rapidity never yet equalled by R.101, and drifting about for some time, screaming like an air-sick sea gull, he fell into Hyde Park in a deflated condition, where he was promptly arrested by the police for hovering with intent to annoy a young female. Pioneers never have much luck.

Coming to that notable gadget, the slot, it is quite possible if possibly improbable, that this was suggested by the flapping of a negligently secured spat. outside the Savoy after lunch one day. The wearer no doubt found himself in a state of unaccountably inherent stability considering the time and place. His gliding angle was much improved and his stalling speed such that he passed the policeman at Charing Cross triumphantly.

One figures to oneself Mr. Handley Page lurking in a Strand A.B.C. shop, behind a rock cake and a glass of milk, and peering forth at the festive luncher with that disdain which a milk diet engenders in the most genial. At first the H.P. optic is stern, then it quickens to a professional interest. He leaves his rock cake and trails the post-prandial perambulator to his home, where he purchases the flapping spat and, rushing to Cricklewood, fits it with a drawing pin to the wing of an OH 400.

Thus perchance the slot was born—who knows?—SPRY.

D.H. STUDENTS MAKE MERRY.

The students of the De Havilland Technical School disported themselves in dancing and general sociability on the evening of Friday, May 9, at the Portman Rooms, Baker St., and 150 couples enjoyed themselves from 20.00 hours until early the following morning.

Capt. and Mrs. Geoffrey de Havilland received the guests, assisted by Mr. and Mrs. C. C. Walker, Mr. F. T. Hearle and Mr. and Mrs. A. T. Eadon. Mr. Eadon, principal of the De Havilland Aeronautical Technical School, was an energetic and efficient Master of Ceremonies, whose efforts were largely responsible for a genial atmosphere which even scholastic headgear of high-visibility crepe paper could not entirely reduce to solemnity.

Prize and novelty dances occurred at intervals, and at 23.30 hours Lady Bailey presented the prizes to successful terpsichoreans, or dancers with unsuspected chalk-marks on their backs. Miss Joyce Eadon presented Lady Bailey with a bouquet, and the gathering drowned her thanks with spirited cheers and musical honours. Mr. C. E. Bridges, district organising officer for the Middlesex Educational Committee, expressed more formal appreciation in a short speech, and Mr. Eadon read a telegram from Sir Sefton Brancker, Director of Civil Aviation, in which he regretted that duty deprived him of the pleasure of dancing with them.

Among the guests were Mr. W. E. Nixon, secretary of the De Havilland Aircraft Co. Ltd.; Major Cordes, of Handley Page, Ltd.; Mr. Reeve, chief instructor of the De Havilland School of Flying, and a number of the personnel from Hendon and the Air Ministry.

OPPORTUNITIES.

There are vacancies with the Cornwall Aviation Co. for a first-class pilot with experience of joy-riding, and for a ground-engineer with experience of reconditioning Avros. Both are wanted immediately, and both jobs offer permanencies to good men.

TWO CELLON DOPING SCHEMES.

The famous dope and cellulose lacquer manufacturing firm of Cellon Ltd. have issued two attractive booklets outlining their doping schemes "C" and "C2."

The "C" scheme has been specially framed for the convenience of firms who are mainly engaged on the construction of Service aircraft, where aluminium finish is practically standard. Complete doping can be done with two or three coats of the required shade, generally red or gray, of Pigmented Dope, followed by two or three coats of Aluminium Dope,—thus the use of Nitro Dope Covering is eliminated.

Certain machines have to be finished in Nivo shade [for night-flying—ED.], and in this case Nivo Pigmented Dope can be substituted for the final coats of Aluminium Dope.

The booklet gives general instructions for use, and outlines the general conditions that affect application. There are also detailed instructions for application either by brush or spray.

The "C2" doping scheme has been specially evolved for the convenience of those who have to repair or renovate machines under aerodrome or "un-heated shop" conditions.

Cellon Ltd., in their standard doping schemes call for a Doping Shop with a temperature between 65 and 70 degrees Fahr. and a relative humidity of less than 80 per cent. This new scheme "C2" permits the application of Dope temperatures down to freezing point with a relative humidity of up to 90 per cent. This means that large components may be doped in the Erecting Shops instead of having to be moved into the Doping Shop This is obviously a feature that should appeal particularly to manufacturers as saving heavy handling charges.

The scheme is also attractive to people who operate joy-ride machines, and to small manufacturers, as it makes the expensive Doping Shop unnecessary.

There is interest in noting that Cellon Ltd. tried out this scheme in the open-air at temperatures considerably below freezing with particularly good results.

Cellon Ltd. have also "Adverse" Schemes, i.e., schemes for use in adverse conditions, for all their methods of Doping, both Acetate and Nitrate. Thus whatever scheme is being used in the Doping Shop, there is an available "Adverse" Scheme to enable the work, which has to be done outside, to be done with the correct materials.

These informative booklets, and any other information about the problems of Doping, may be had by writing and asking for them from Cellon Ltd., Cellon Works, Upper Ham Road, Kingston-on-Thames.

SATISFACTIONS.

OLYMPIA LTD.—Satisfaction in full on Apr. 25, 1930 (1) of charge dated June 24, 1929, and registered July 12, 1929, (2) of mortgage dated Sept. 19, 1929, and registered same date, and (3) of charge as further security dated Jan. 30, 1930, and registered Feb. 17, 1930.

PERSONAL NOTICES.

DEATH.

CHARLESWORTH.—On May 5, at Jhelum, India, as the result of a flying accident, L-AC. Ernest Raymond Charlesworth, R.A.F.

FORTHCOMING MARIAGES.

CLARK—LOWE.—The engagement is announced between Ronald William Macdonald Clark, Flg. Off., R.A.F., only son of Mr. and Mrs. W. Campion Clark, of Chalfont St. Giles, Bucks, and Flora Audrey Lowe, only daughter of the late John Wingrove Lowe and Mrs. C. F. Chinery, of Abukir, Egypt.

SAUNDBY—REES-WEBBE.—The engagement is announced between Sq. Ldr. Robert H. M. S. Saundby, M.C., D.F.C., A.F.C., R.A.F., second son of the late Professor Robert Saundby, M.D., LL.D., F.R.C.P., and Mrs. Saundby, of The Tower House, Harrow-on-the-Hill, and Joyce Mary, elder daughter of Major M. O. N. Rees-Webbe, late The Northamptonshire Regiment, and Mrs. Rees-Webbe, of Berkeley House, Weymouth, and grand-daughter of the Right Hon. Sir Edward Clerke, K.C.

MARRIAGE.

COOPER—BANKS.—May 3, at St. Mark's, Portsmouth, Reginald John Cooper, Flg. Off., R.A.F., to Catherine Margaret Banks.

BIRTHS.

MOYES.—On May 10, at 90, Wigmore Street, W.1, to Vera, wife of Major Eustace Moyes (late R.N.A.S. and R.A.F.)—a son.

ROBINSON.—On May 6, at the Florence Nightingale Nursing Home, Derby, to Anne Lilian, wife of Dennis Robinson, 6th Batt., The Gloucestershire Regt. (late R.A.F.)—a son.

THOMAS.—On May 8, to Dorothea (née Knatchbull), wife of Flg. Off. R. Thomas, R.A.F.—a daughter.

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For the convenience of Advertisers, replies can be received at the office of THE AEROPLANE, Cannon House, Pilgrim Street, London, E.C.4.
Special PREPAID Rate—18 words 4/6, 3d. per word after; 13 insertions, 18 words, 4/-; 26 insertions, 18 words, 3/6; 52 insertions, 18 words, 3/-, 2d. per word after. Situations Wanted ONLY—18 words 1/-. Box No. 6d. extra.

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Wanted Urgently—X type Mark II Cirrus-Moth. Slots preferred. Good price for good machine—Phillips and Powis Aircraft (Reading) Ltd., Reading Aerodrome. Sonning 114.
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To All Aeronautical Firms.—The specialised advertising and marketing service required in the aviation field is provided by Aeromarine Advertising Ltd., 56-57, Fleet Street, London, E.C.4. (Tele.: Central 2423.) This service is free to clients. Leading aeronautical firms use this specialised organisation, which has been built up by aviation experts. Write or 'phone.

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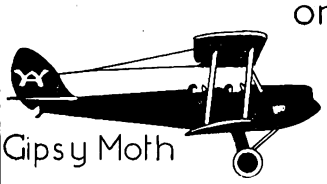
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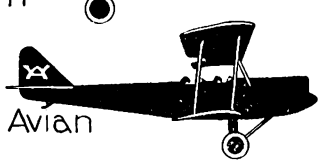
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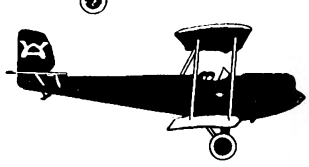
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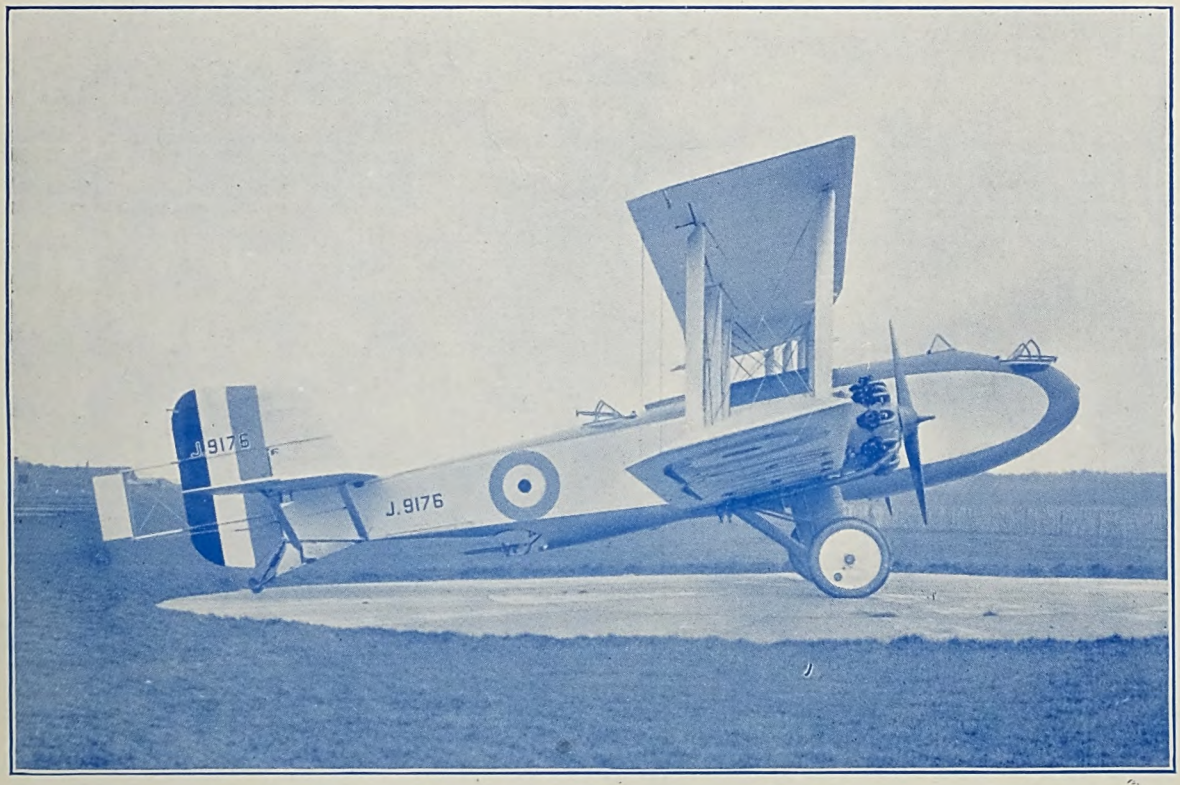

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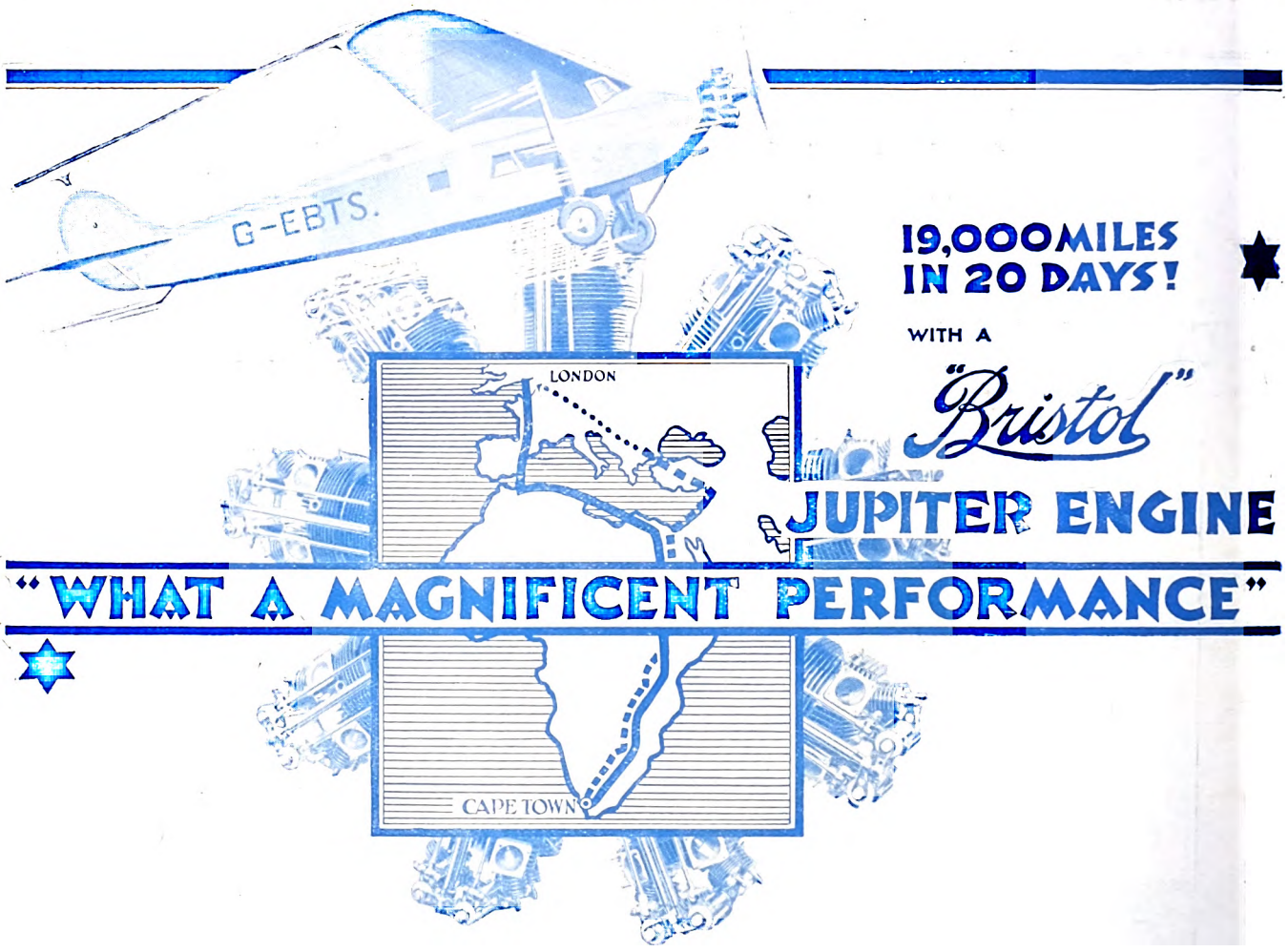

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THE AEROPLANE

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INCORPORATING AERONAUTICAL ENGINEERING

Edited by C.G.Grey

A BLACKBURN BLUEBIRD SIDE-BY-SIDE ALL METAL BIPLANE — (BUILT BY SAUNDERS-ROE LTD.), FOR WHICH AUTO-AUCTIONS LTD. ARE THE SOLE—

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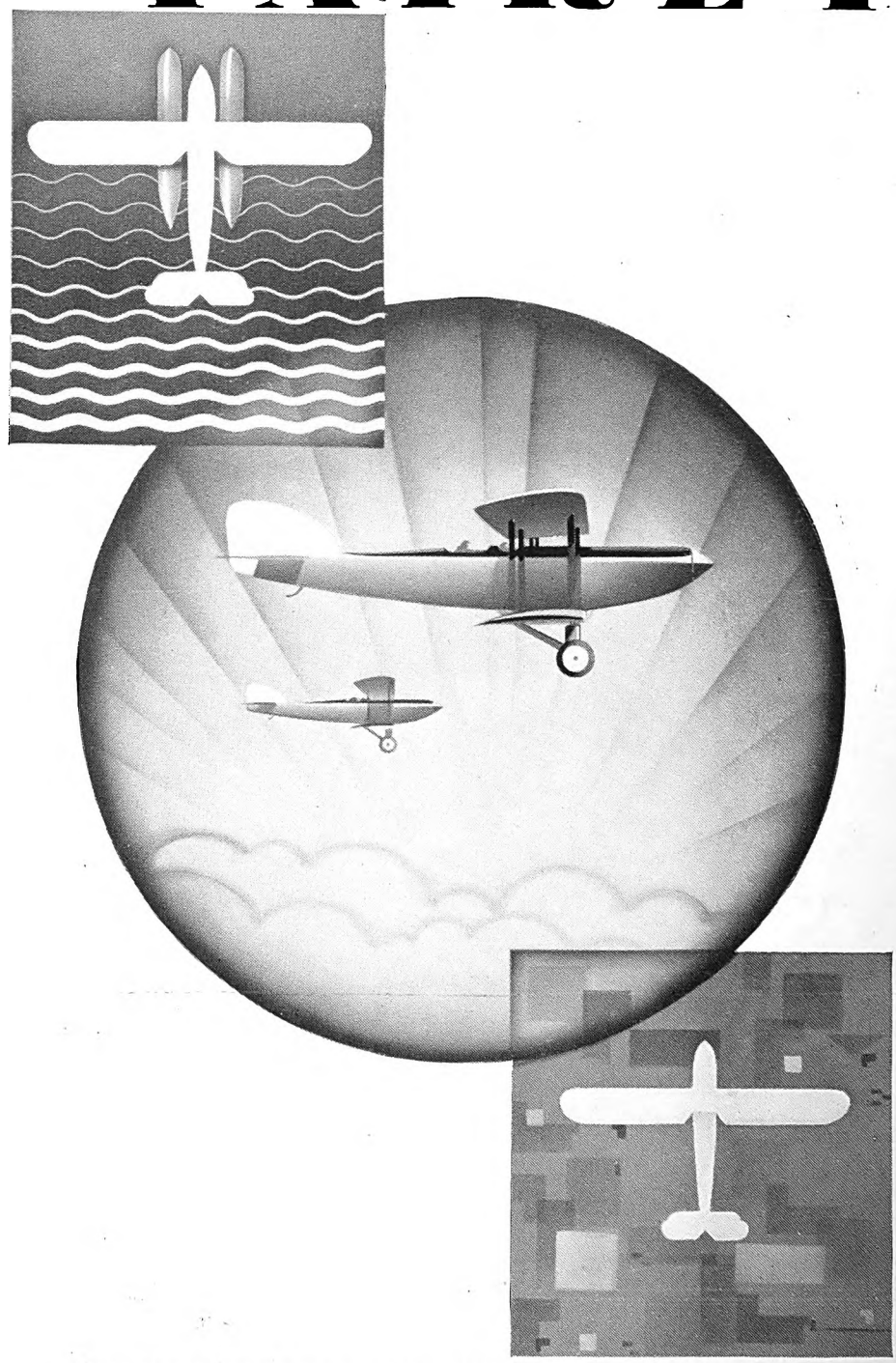

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MAY 21, 1930.

THE AEROPLANE

Incorporating
Aeronautical Engineering

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ON BUILDING BRITISH TRADE.

This week THE AEROPLANE presents to its readers the second of a series of Special Supplements which are being produced for the express purpose of advertising British aircraft all over the World. And we of the Staff of THE AEROPLANE who have been responsible for the descriptions and illustrations contained in this Supplement hope that it will fulfil its object, which is simply to give people all over the World a practical idea of how these particular aeroplanes and engines are produced, and to give that confidence in these British products which can best be got by seeing for oneself how a thing is made and by knowing as much as possible about the material of which it is made.

One of the most satisfactory features about these first two Supplements which we have produced, namely the Moth Supplement on April 2 and the Bluebird Supplement this week, is the way in which the manufacturers of the aeroplanes and engines have been backed up by the manufacturers of raw materials, parts and accessories of which the said aeroplanes and engines are built.

For the past eleven years or so, since Government orders for war-machines in mass production were cancelled, the output of British aircraft and aero-engines has been so small that some of the great manufacturers of raw material, such as steel and aluminium, and of component parts or partially manufactured material, have been inclined to regard the Aircraft Industry as hardly worthy of serious attention, and certainly not as a potentially great Industry like the Ship-Building Industry or even the Motor Trade. But more recently the trade in aircraft has grown to such an extent that the makers of raw material are beginning to find that it is something to be taken very seriously indeed.

This is so more particularly since aeroplanes have come to be made almost entirely of metal. There is now serious rivalry between steel and the various aluminium alloys, and, though there will always be a certain amount of each material used in practically all aircraft, we are still far from being able to decide whether the bulk of the material in an aeroplane shall be steel or aluminium.

The fact remains that what with the increased output of aircraft and the increased use of metal in aircraft certain firms are finding that their aircraft orders for aircraft material absorb quite a considerable percentage of their output. For example, the famous Reynolds Tube firm state definitely that 40 per cent. of their total output now goes to aircraft firms, and Accles and Pollock Ltd., who were the pioneers of special steel tube work for aeroplanes, still find that aircraft absorb a goodly portion of their output. Where aluminium is concerned no actual figures are available, but one has been told that more of the duralumin manufactured by James Booth and Co. Ltd. goes to aircraft firms than to any other line of business.

That being the state of affairs, naturally the many hundreds of firms who supply material to the few firms who constitute the Aircraft Industry are now more interested in backing up the efforts of their customers, the manufacturers of aircraft, than ever before.

THE BASIS OF PROPAGANDA.

Readers of this paper who do not already know the fact will be interested to learn that no newspaper of to-day is able to exist without advertisements. Practically every newspaper is actually sold at a loss, by the time trade discounts and wholesale discounts have been deducted from the selling price to the public. There is quite an old story of a newspaper man who told a friend that in every penny newspaper there was at least two pennyworth of paper. To which the friend replied "Well, that shows how the stuff you write spoils good paper, doesn't it"? Which may or may not be true.

Whether or no, the fact remains that without advertisements the great British public would not get the amount

STRANGERS WHICH WERE THERE SPENT THEIR TIME IN NOTHING ELSE BUT EITHER TO TELL OR TO HEAR SOME NEW THING."—*(Acts 18-21)*

NOVELTY SEEKERS.—An example of the interest aro used by new things in aviation—the crowd round the Comper Swift (A.B.C. Scorpion) with Mr. L. S. Snaith (R.A.F.) as pilot, at Brooklands.

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of reading matter they do about their own particular hobbies. Consequently the more support the British aeronautical papers get from manufacturers of raw material, parts and accessories the more they can tell readers all over the World about the high qualities of British aircraft. And the more the high qualities of British aircraft become known, the more business there will be for makers of raw material. And, in these days of reduced Navies and armaments generally, there is need for new and promising markets.

A Matter of Proportion.

During the past few weeks, while studying the whole subject of how The Aeoplane can best serve the interests of the British Aircraft Industry, one investigated the very interesting question of what proportion of the cost an aeroplane goes into raw material, parts and accessories, apart from the actual machining and manipulating of material in the manufacturers' own works and the assembly of those parts into complete aeroplanes. Various friends in the Trade were so kind as to go into their own particular figures, and one found remarkable agreement between the estimates of various engineers.

Naturally the firm which buys its material as nearly as possible in the raw state and works it up in its own factory pays less for raw material and more for labour than does a firm which buys parts already partly manufactured. Some firms make certain parts of their machines almost entirely themselves, with the result that their bill for the raw material in those parts goes down to about 15 per cent. But they may buy other parts, as for example tail units, in a finished state ready for covering so that considering them as raw material they absorb about 30 per cent. of their finished value.

Among engine firms the cost of raw material runs higher than it does among manufacturers of aeroplanes, because so much more of the firm's own work is done by machinery, and so the wage-bill is lower in proportion to the bill for raw material.

Also magnetos and carburetters, which are bought as finished articles, account for a high percentage of the total cost of engines,—especially engines for light aeroplanes. On the other hand, the magneto people and the carburetter people, although they absorb a good deal of money from the engine firms, themselves spend a great deal on raw material.

Thus, taking the whole Trade by and large, a fair estimate for the cost of raw material would be about 25 per cent.

Where the Money Goes.

Now the annual Air Estimates for several years back show that the amount of money spent each year on Technical and Warlike Stores has been something over £8,000,000. Of this something in the region of £6,000,000 has been for new aeroplanes, new seaplanes, new engines and spare parts supplied by the makers of these machines. The rest has been spent on stores and materials of various sorts bought direct by the Air Ministry from the producers of raw material, parts and accessories.

In other words, at a rough estimate the manufacturers of these raw materials, parts and accessories have had approximately £1,500,000 per annum paid to them by the British Aircraft Industry for material supplied for aircraft and engines, and probably slightly more than that amount direct from the Air Ministry. That is to say, the auxiliary and ancillary trades connected with the manufacture of aircraft and engines have been getting something between £3,000,000 and £4,000,000 of the Taxpayers' money through the Air Ministry.

In addition to this, the British Aircraft Industry has been doing quite a good export trade during the last twelve months. As was shown in The Aeroplane of April 30 the total value of our exports of aeroplanes alone during 1929 was £800,000 and there were £500,000 worth of engines and £800,000 worth of parts, making altogether a total of aircraft exports of about £2,000,000. So the makers of raw materials, parts and accessories had another £500,000 out of the British Aircraft Industry apart from the Air Ministry orders.

Where Profits are Made.

Hitherto these ancillary and auxiliary trades have not done much to help the British Aircraft Industry's efforts to secure trade over-seas. That is quite understandable. An order for steel from an aircraft firm seems ludicrous alongside an order from a shipbuilding firm, or even a big motor firm. And small orders will not stand much expenditure on advertising. But now things are beginning to look different. Our Over-Seas Trade in aircraft is becoming something considerable, and be it remembered it is the only kind of trade out of which this country can make a profit.

The Nation as a whole makes no profit out of selling aeroplanes to the Air Force or to private owners or to air lines in this country. The truth is that, barring the fact that the Air Force is a species of Imperial Fire Insurance, aeroplanes and engines and aircraft material sold to the Air Force are just like fireworks. They are merely made to be destroyed. They serve no useful purpose as transport vehicles, except those few which are used overseas for transport of administrative officials, and the occasional aeroplane which is used in this country to save the valuable time of the Prime Minister when he takes a short holiday at Lossiemouth.

This paper is the last publication in the World to suggest that money spent on the Air Force is in fact money wasted. Nobody knows better than we do the value of the Air Force and how much better off we should be as an Empire if we had an Air Force twice as big as ours is to-day. But from the purely economic point of view selling aeroplanes to the Air Force brings no profit to the Nation, whereas every aeroplane which is sold abroad, whether it be to a British Dominion or to a Crown Colony or to a foreign nation does show us a definite profit.

Even if the manufacturer of an aeroplane sold over-seas makes a loss on it as a trading proposition, the fact that the raw material has been paid for in the shape of wages to British labour means that whatever money comes from overseas is money paid to this country for work done, more especially because aeroplanes and engines, probably more than any other product, are built almost entirely of materials either grown or produced in this country.

The Quid Pro Quo.

In view of the fact that the auxiliary and ancillary trades have done so well out of the trade in British aircraft in the past, everybody in the Aircraft Industry will be the more pleased to see members of these trades supporting so well the efforts of The Aeroplane to bring more business from over-seas to their customers in the Aircraft Industry. And one feels sure that those firms which do thus give practical evidence of a desire to support the British Aircraft Industry will find that their co-operation will itself be duly recognised by the British Aircraft Industry in the future.

A Worth-While Effort.

All these firms are showing good sense and foresight in thus supporting the Aircraft Industry, because the Air-

TO BUILD BRITISH TRADE.—Personnel of the Indian Branch of the De Havilland Aircraft Co. Ltd. under Wing Commander D. S. K. Crosbie. Left to right: Mr. Stander (pilot) and Mr. Lofthouse (ground engineer). Sitting: Gadhi (storekeeper), Nasan (office boy), Mehta (head clerk), and an Indian fitter.

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The record flight to India——

was carried out by Squadron-Leader A. G. Jones-Williams, M.C. and Flight-Lieut. N. H. Jenkins, O.B.E., D.F.C., D.S.M. flying a Fairey (Napier) monoplane fitted with Napier engine. 4130 miles were covered in 50 hours 38 mins.

No other engine has successfully completed the non-stop flight from England to India.

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THE AIR TRANSPORT (SUBSIDY AGREEMENTS) BILL.

In the House of Commons on May 13, moving the Second Reading of the Air Transport (Subsidy Agreements) Bill, the Under-Secretary of State for Air said that the purpose of the Bill was to give the President of the Air Council, the Secretary of State for Air for the time being, statutory authority to enter into long term agreements to spend by way of subsidies up to £1,000,000 in any year for the next ten years. The amount was a gross figure and included Appropriations-in-Aid, for instance, in the Cape to Cairo service. These Appropriations would amount to more than 68 per cent. of the cost of subsidies. The covering figure of £1,000,000 had been made in the light of possible developments in civil aviation.

Sir Samuel Hoare said that he had already ventured the criticism that it was unnecessary to ask the House to give the Air Ministry powers it already possessed. The actual expenditure the House had been asked to vote in the present Air Estimates was £428,000. If this new Bill became law an expenditure was contemplated of more than double that amount.

He asked the Under-Secretary of State for Air what lines of policy were behind the actual terms of this Bill? What new lines had he in mind as fitting objects for the increase in subsidy. At present the Imperial Airways Company had a monopoly of subsidy over the main European lines, over the line to India and over the contemplated line to Cape Town. He imagined that the Government had no intention of breaking the agreement with that Company and therefore they did not contemplate subsidising other services on the three main Imperial Airways lines.

The Under-Secretary of State for Air had already said that he could do nothing to help the proposed civil air service in the West Indies. He would like to know whether the Government contemplated subsidising an air service to South Africa along the western route to take on its way the West African dependencies of the British Empire? Did the Government contemplate subsidising lines outside the British Empire, like the air line across the Southern Atlantic to South America? Did the Government contemplate subsidising short distance air lines over these shores or between Ireland and Liverpool and London?

With regard to the proposal to include subsidies to airships in this general authority, airships were at present in an experimental stage, although it was proposed that within the next few months one of them should fly to Canada and the other to India. Supposing these experiments succeeded, how did the Under-Secretary of State for Air propose to bridge the gap between the experimental stage and the operational stage of a regular airship service.

When an enterprise was new and uncharted, as was the development of airships, the sooner the Government could get out of it and private enterprise come into it the better for everyone concerned. The time had come when we should begin to consider the possibility of creating an Empire Airship Transport Company. The overhead charges of an airship company would be so great that he was afraid that no single company would be prepared to face them.

The Bill envisaged a period of ten years, a very long time in the history of aviation considering that it was about half the life of the whole period of air transport. The limited number of civil air liners at present plying regularly over two or three lines had built up for themselves in the world a remarkable good-will. They had a fine record for regularity, safety and punctuality, but no one would say that we should be satisfied with the present state of affairs. We had gone slow. We first had to show the world that an aeroplane could start definitely at a regular time and that it could carry passengers and freight comfortably and return at a definite time. But that was only the first stage, and he would be very sorry if, during the years contemplated under this Bill, the progress of the next ten years proved to be as slow as the progress of the last ten years.

At present there were about 30 British air liners flying backwards and forwards between certain given points, carrying passengers, mails, and freight. Their average speed was something under 100 miles an hour. Although great improvements had been made in recent years they did not carry passengers in any great comfort as compared with a modern train or an Atlantic liner. They were still noisy, the cabins were narrow and the aerodrome was very often a long way from the point to which the passengers were going.

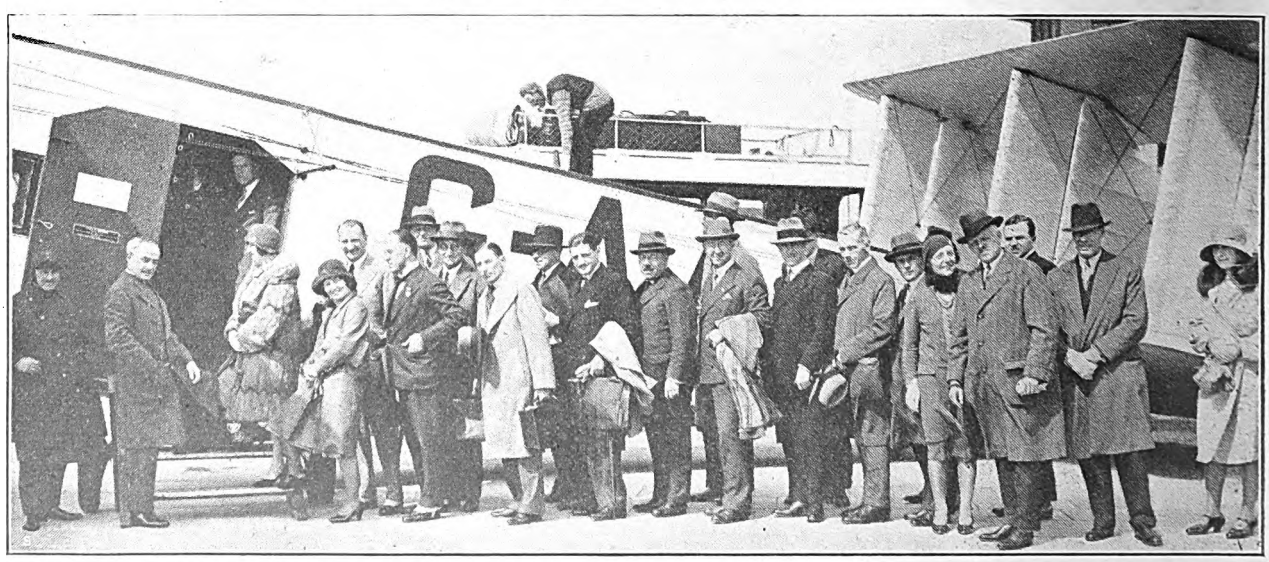
He suggested that a substantial part of the proposed sum should be devoted to the encouragement of new experiments with a view to trying out new kinds of service and new methods of operation. It would be wise to encourage diversities of types of machines and diversities of services, to make the experiment and differentiate between passenger services and mail services upon some given line.

The existing machines only went 100 miles an hour, they travelled by stages of not more than 300 or 400, at the utmost 500 miles, and they did not fly by night. From the point of view of the mail services the post was not gaining the advantages that it might gain under a much quicker kind of service.

Some of this money might be devoted to an experiment on mail services with small, quick machines travelling at the rate of not less than 150 m.p.h. for stages of 700 miles. These longer stages would avoid some of the complications of landing in foreign countries. With a service of this kind mails could be taken to and from India in about 36 hours instead of the six, seven, or eight days now taken by the passenger service. With a similar experiment it might be possible to take British mails to South Africa and bring back the South African mail in 72 hours for each journey.

Passenger lines could be made a great deal more popular and attractive than they were at the present time. The number of passengers was still less than many had hoped. With increased subsidies it would be wise to insist upon the development of much bigger and more comfortable passenger machines than at present. Experiments might be made down the West Coast of Africa by big flying-boats in which much greater advantages could be offered to the passenger. He thought that the really big machine of the next ten years would be the flying-boat rather than a land machine. The practical difficulty of the big aeroplanes was the strain upon the wheels when they landed and the difficulty of finding aerodromes large enough for them to land and take off. A useful and practical service would be with flying-boats that would take 30 or 40 people and even more at the end of ten years.

If the development of the next ten years was going to be



EARNING THE SUBSIDY.—Delegates to the Conference of the Incorporated Sales Managers' Association at Scarborough emplaning at Croydon in an Argosy (three Jaguars) of Imperial Airways Ltd.

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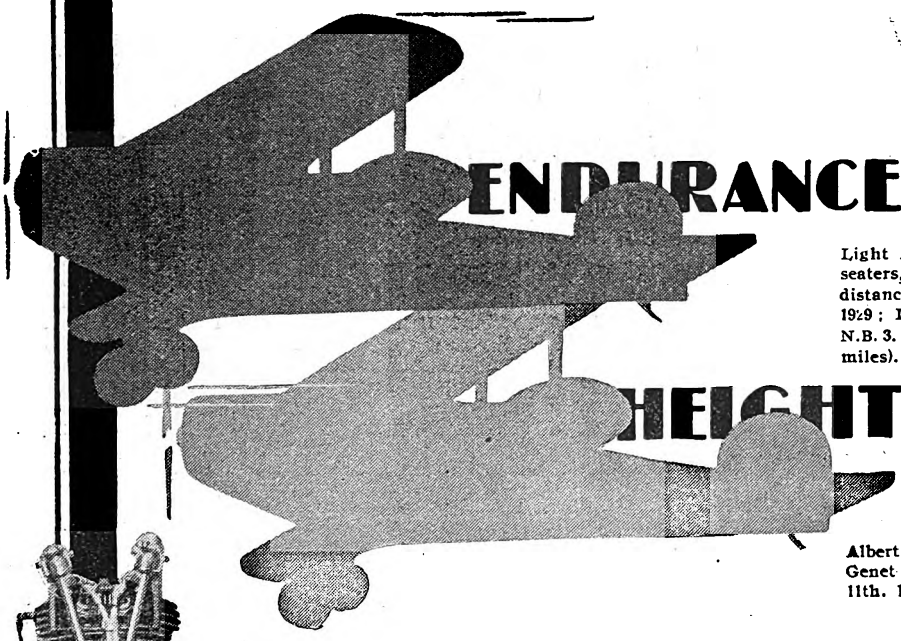
2 WORLD'S RECORDS

OF THE ARMSTRONG SIDDELEY GENET

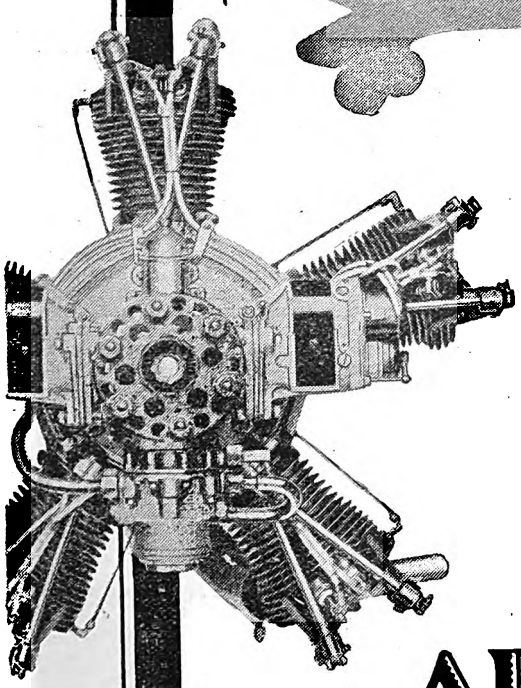


ENDURANCE RECORD

Light Aeroplanes, 3rd category, single seaters, weight 200-350 kgs. (440-770 lbs.), distance in a straight line, July 17th, 1929; D. S. Zimmerly, Barling, U.S.A., N.B. 3, 80-88 h.p. Genet, 2,500 kms. (1,553 miles).

HEIGHT RECORD

Light Aircraft, 3rd category (single seaters weighing less than 350 kgs.), Altitude (France). Albert monoplane fitted with 80-88 h.p. Genet engine at Le Bourget, February 11th, 1930, 7,730 metres.



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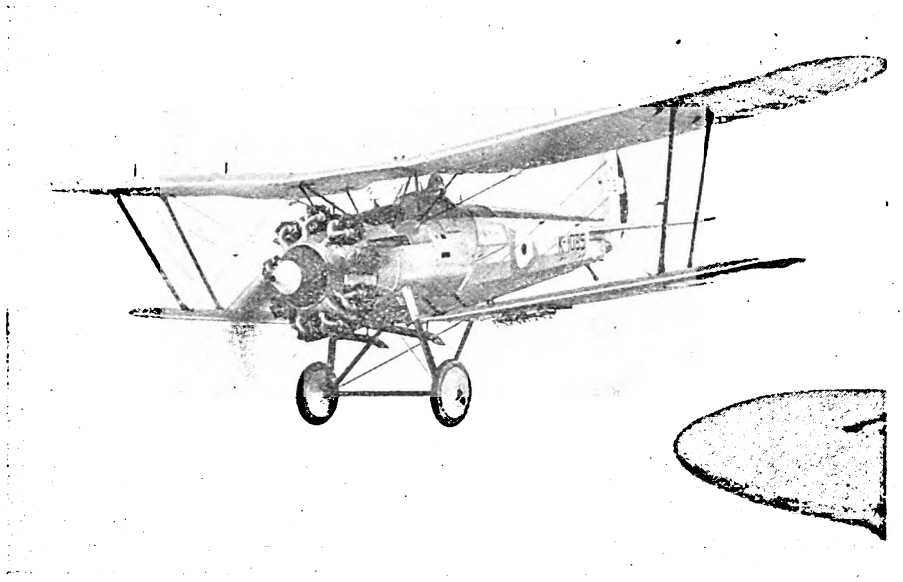

["Aeroplane" Photo.

"The finest example of steel construction the aeronautical world can show to-day."

The

Bristol"

BULLDOG

ALL-STEEL, SINGLE-SEATER

FIGHTER

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

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to commercial interest in Bombay and Calcutta was not good enough to justify the payment of the extra money and there had been far too many accidents and breakdowns. The factors that were preventing development over new routes were the lack of initiative of the Air Ministry and the need for spending money.

Before the House gave the Air Ministry sanction to enter into contracts amounting to £1,000,000 a year for ten years, it ought to know what new routes the Air Ministry had in contemplation. Also what had happened to the Consultative Committee.

What amount of money did the Air Ministry intend to spend upon lighter-than-air craft in the next ten years? Was it true that they were going to build a new airship and to start a new method of mooring mast. If we were going to launch out into a seven million cubic feet airship, that money was going to be poured down the sink. The R.100 and R.101 were failures, both commercially and technically. They could not carry a load that would make them pay commercially and they could not fly fast enough to make any long-distance flight in any wind other than in a light breeze or in a dead calm. The man who designed the airships and was responsible for energising three Governments to spend over £2,000,000, had turned King's evidence and described the failure of the two airships in a book.

The Air Ministry knew they could not come before the House and ask for approval to build a 10,000,000 cubic feet airship because that would mean rebuilding all the airship sheds all over the world, so they were in favour of going on with a scheme half way between the airship which had proved a failure and the airship which Sir Dennistoun Burney thought would be a success. He hoped for an assurance that no policy of this sort was contemplated. [All this about airships is sheer nonsense. The airships, like Mr. Malone's essay in Bolshevism, which cost him his Service rank, were an experiment, but they differ from his in not being failures. Considered as experiments both R.100 and R.101 are highly successful. There are certain obvious constructive criticisms possible about both of them, but none so fundamental as those which might be made of Mr. Malone himself.—C. G. G.]

VISCOUNT LYMINGTON said that obviously the great commercial communication lines of the future must centre on such islands as those between Australia and India and those of the West Indies, situated between great continents and between great commercial centres. It was worth while risking more money and applying more money to envisage, with real imagination, some hope for the future, to get an air service where we in this country would have been the pioneers and would have the first whack of prosperity that might be coming.

An effective compromise could not be made, except at great price, to get an air service that would carry both passengers and mails with equal success. In America they had an enormous commercial air mail service flying by night and under all conditions with the routes lit from start to finish, but they would not carry passengers on them.

Canada, as a link between the Far East and ourselves, had more need than any other of our Dominions for a great air service and a great air policy. Here was a chance for us to step in with imagination and with the help of the Canadians. [Thank you! But Canada knows far more about air transport than we do, and is much better able to help us than we are able to help her, the Lady of the Snows.—C. G. G.]

Another point which had not been stressed was the desirability of getting machines of our own manufacture into the air services of the world. A system of subsidies might be directed towards the factory just as much as towards the actual manipulation of the air services. We should encourage the mass production of commercial aircraft. To-day we had some 28 machines as our commercial air fleet and we had an airship tied by a nose ring to a post—like a bull at a fair—or two airships, but that was the total of which we could boast to-day. [That is merely because hitherto we have not made what the market has wanted, and because our great financiers have not, till lately, been interested in aviation.—C. G. G.]

MAJOR MILNER asked whether the subsidies would be made available to local authorities who, if not willing to provide regular services, were at least willing to provide aerodromes. [Public money is already available for this purpose under some scheme for the relief of unemployment.—C. G. G.]

MR. BAILLIE HAMILTON suggested that some guarantee should be given by British companies that when they were provided with subsidy money they would devote some of their energies and some of that money to popularising British aircraft all over the World.

CAPTAIN SIR WILLIAM BRASS wanted to know, like Sir Samuel Hoare, whether experiments could be made with this money or whether it must be spent on companies now in existence or which will exist in future. He would like to see the mails coming from South Africa taken off by catapult near Madeira and then brought by air, or the mails from East Africa delivered by air from Aden. [But why not bring both lots all the way by air? Why advocate half measures, and mix up practical aviation with the Marine Mind?—C. G. G.]

He thought that if people's letters were delivered by air mail regularly they would take opportunities themselves to go by air. Would the subsidies include money for aerodromes, for night-flying aerodromes, meteorological services and for experiments in making big flying-boats? Was the £1,000,000 cumulative. Could the money not spent in one year accumulate and be spent the next year?

REAR-ADMIRAL SUETER asked who was advising the Air Ministry about where we could carry mails economically and efficiently. He thought Canada might be approached to see whether they could develop the air services in the West Indies on Imperial grounds. [There does not seem to be enough business in the West Indies to make such an effort worth while.—C. G. G.]

He thought that probably we might have to run our mails straight from this country to Malta in future. We ought therefore to develop Malta as a first-class air base.

He asked what was being done to make large flying-boats more seaworthy and thought that something ought to be done to give them more buoyancy so that when they came down on the surface of the sea they would not break up at once.

Was the Director of Civil Aviation getting the latest instruments for flying in fog and sandstorms?

Mineral springs might be found in Canada from which we could get helium gas for the greater safety of airships.

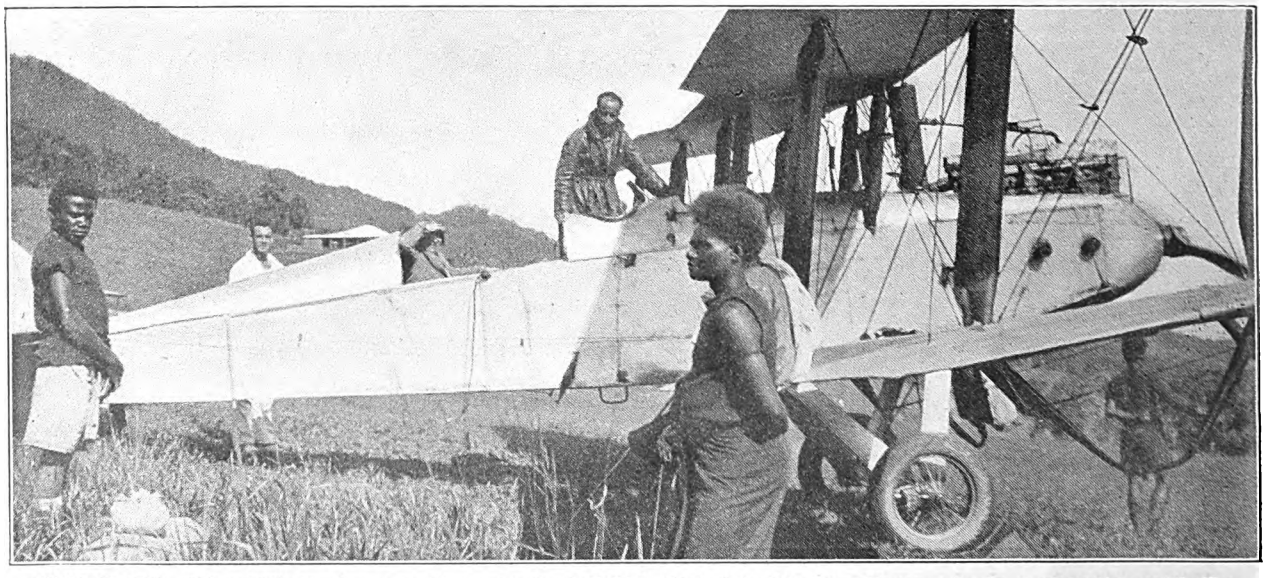
He would like to know what assistance was being given to those who were running the small airship A.D.1 in this country.

He thought it would be a retrograde step to divorce Civil Aviation from the Air Ministry. [A diversity of ideas, and some of them worth further consideration.—C. G. G.]

MAJOR ELLIOT raised the question of the Abbot's Inch aerodrome which, he said, had been seized by the Air Ministry for the Auxiliary Air Force after it had been selected by Glasgow for a municipal aerodrome.

MR. MONTAGUE, replying, said that the Bill did not provide money for Civil Aviation and would make no difference in the authority of the House over the expenditure upon subsidies or upon Civil Aviation under the Estimates. The Bill was to give statutory authority to the President of the Air Council or the Secretary of State for Air to make long-term agreements instead of allowing the whole question of those agreements to rest upon the year-to-year financial sanction of the Estimates themselves. The agreements would have to be settled by the House of Commons on the appropriate vote, but if an agreement was entered into there would be a statutory authority for it and even a change of policy on the part of a succeeding Government would make no difference to payments under that agreement.

The Air Ministry had a number of schemes on hand at the present moment and must get on with those services before they could consider any other large scale services. The Air Ministry were probing



VETERANS.—The picture shows a Puma-engined D.H.9, piloted by Mr. Ray Parer, who in partnership with the late Mr. McIntosh, flew from England to Australia in 1919. With him is Mr. Cyril Parer, presumably his brother, and Mrs. V. Florance. Mr. Parer and the old Puma-Nine may in these days fairly be regarded as among the veterans of aviation. The machine and crew are here seen leaving Wau, Bulolo, New Guinea, where the gold mines are, on Dec. 30, 1929. They arrived at the coast at Salamoa after what Mr. Parer described as the roughest flight he had ever had. This route makes possible by air in 25 minutes a journey which by land takes between a fortnight and three weeks. Aircraft start at a height of 4,000 ft. and cross a mountain range at 6,000 ft. before gliding down to sea-level. The photograph was sent by Mr. R. K. Copperthwaite.

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every possible direction in order to come to a solution on the West Indies question. They hoped to find a solution and if a scheme was found to be practicable on the larger lines of Canada, the West Indies and South America no one would be better pleased than the Air Minister and himself. [To do this job properly we should come into direct competition with Pan-American Airways, and to be successful would cost us far more money than the job would be worth. This is a route for which Canada and the West Indies should pay. We should do far better to concentrate on a line from England to South America and by West Africa to the Cape.—C. G. G.]

The next stage of the airship programme must be upon lines that would be of practical use for the possible commercial development of airships. Experiments must be made in order to know what kind of regular service airships of this kind could undertake.

The Consultative Committee had met regularly and gone very thoroughly into a number of important questions. He did not propose to make these reports public. The first report was on the subject of the West Indies and the second report dealt with the general question of aircraft manufacture and the relations of the Air Ministry to trade in regard to the conditions of manufacture. The third report would deal with the very important question of scientific research and development.

With regard to co-operation with Canada in the development of aviation, Canada had her own aircraft lines and was enterprising and vigorous enough to develop her own aviation. The subsidies provided for air services were intended for maintaining Imperial Communications. [One hopes this includes Imperial Trade Communications with countries out of which we can make a profit and not merely with Crown Colonies which hope to make a profit out of us.—C. G. G.]

The cost of a breakwater in Malta would be very formidable.

The Air Ministry had not been in competition with the Corporation of Glasgow for the purchase of the land at Abbot's Inch. The Air Ministry had that land in mind quite a long time ago, although the purchase had been delayed on account of certain technical difficulties. The Air Ministry were most desirous that municipal aerodromes should be encouraged but military conditions had to be considered. He hoped that the Corporation of Glasgow would not slacken their efforts to establish a municipal aerodrome.

MR. MANDER asked whether it would be possible to pay subsidies to municipalities for light aeroplane clubs which might decide to run passenger or other services to different parts of England.

He would like to know why the Indian Air Mail service was reverting to the route by the coast of Italy which was longer than the present route by Athens after the Italian Government had made a great many difficulties.

He would like to see Civil Aviation taken away from the Air Ministry and put in either a separate department by itself or under the Ministry of Transport.

SIR PHILIP SASSOON said that compared with the sums which were annually spent by other countries, the sum of £1,000,000 was not much to boast about. He would like to know whether any plan or policy was being prepared in connection with this sum of money. Did it mean business or was it merely a gesture?

He hoped that in one way or another the whole of the sum for which powers were now being taken would be spent. The development of Civil Aviation did not depend only upon giving subsidies to air lines, there were many other ways, through survey companies, light aeroplane clubs, etc.

No one had greater admiration than himself for Imperial Airways in regard to reliability, punctuality and safety. They were the only nearly self-supporting company in the World and had got nearer than any other to the ideal of flying by itself, but they were in a position of splendid isolation in that they were the only British subsidised air line. He was not a believer in unrestricted competition, but he thought a little competition was good for the soul.

He would like to be assured that the whole of the sum in subsidies was not going to Imperial Airways and that all of it would not go to airships. He would like to see one or more flying companies in this country for the purpose of developing other air lines both within these islands and outside.

There was no lack of openings within the Empire or between parts of the Empire and other countries for other services which would not compete with Imperial Airways but which would act as a challenge to Imperial Airways to maintain the same outstanding position that they had held so far among the air lines of the world. [Excellently put, and quite the best thing said in the debate except for some of Sir Samuel Hoare's suggestions.—C. G. G.]

He hoped that subsidies might be given to encourage mail services as distinct from services which carried mails and passengers. Mails were carried between San Francisco and New York at a speed of 150 m.p.h. and there was no reason why we should not equal that. It ought to be possible to send a letter to India and get a reply by air in the same time that it now took Imperial Airways to do the journey one way. At present except for very special services the amount of time taken made it hardly worth the extra cost, but if a letter could be got to India in three days it would put the service in quite a different category, and a far wider public would be encouraged to take advantage of this quicker method.

Our important trade with South America would be immensely assisted by speedier methods of sending mails. The French had already started a service of mails to South America and with all our important interests in South America we ought not to be dependent on foreign lines.

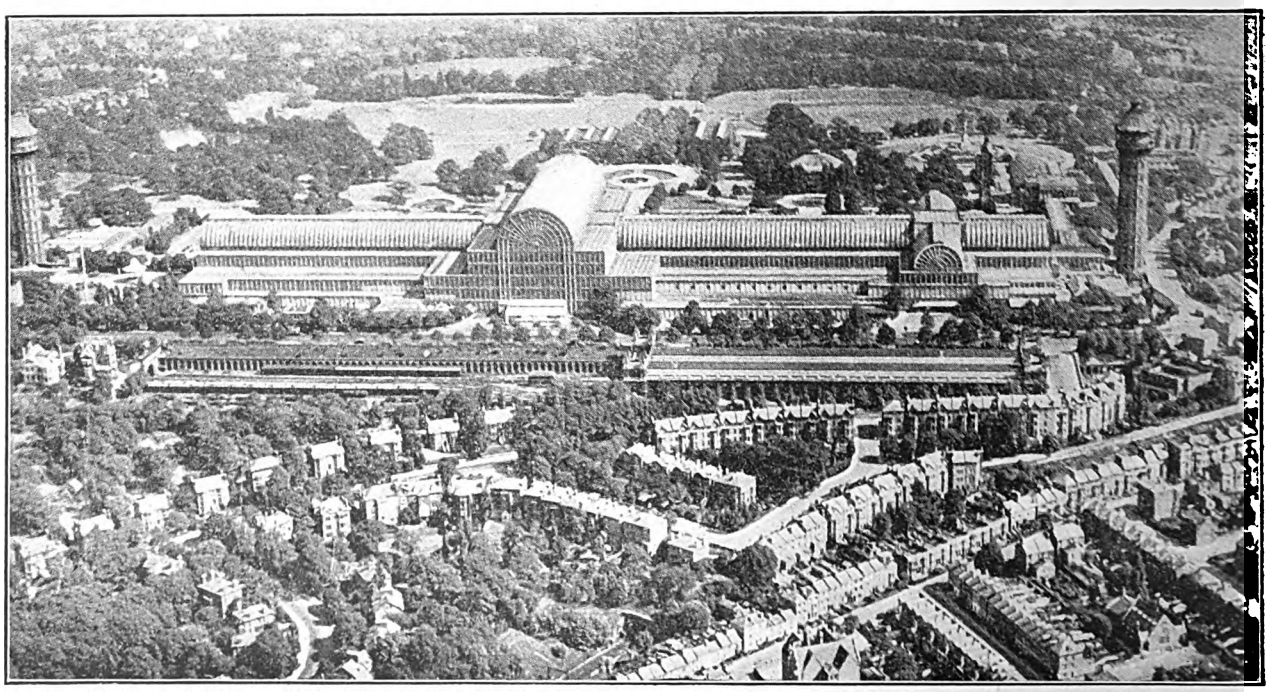
COLONEL WEDGWOOD protested against giving large grants of public money to private companies without securing on the boards of those companies some representation of the public interest. [Imperial Airways Ltd. *have* a Government Director, so what is he grumbling at?—C. G. G.]

MR. ALBERY asked for an adequate air service between this country and Ireland and said that he thought that the authorities of the Free State and of Northern Ireland would go more than half way towards bearing a share of any subsidies that might be involved. [Who wants to communicate with Southern Ireland, anyway? And the weather in the North of the Irish Sea makes an air service impossible for about 70 days in the year.—C. G. G.]

MR. HOPKIN asked for an airship base at Pembroke Dock.

MR. CHARLES WILLIAMS appealed for the West Country and wanted air bases at Plymouth, Devonport and Torbay. He also wanted to know whether the money could accumulate. He pointed out that under modern conditions in the next few years there might be some invention which might render many of these agreements so much waste paper. He thought that there should be in the Bill definite terms laid down that the bulk if not the whole of the material used and subsidised by this money should be of British origin. [Also an excellent idea.—C. G. G.] He believed that if we left Government control out of these matters our air services would develop very much quicker and in a very much more lucrative way.

MR. EVERARD said that as English people were finding this money they were entitled to the first benefits of the expenditure. Was there any likelihood of different firms and individuals wishing to start new forms of air transport in this country receiving any of this money. We were going backwards in certain respects. Two years ago there had been air transport to the Channel Islands. That service had since been discontinued. Another firm had taken on the service last year but to-day there was no service at all. Part of this money could well be spent in the improvement of the aerodromes in this country and for better ground organisation. No subsidy should be given to any company for the use of any machine any part of which was of foreign manufacture. [Sound enough, but this money is to subsidise actual services. It cannot well be spent on local aerodromes and such things. What is needed is the development of air lines along trade routes which are not necessarily strategic airways.—C. G. G.]



A LONDON LANDMARK.—The Crystal Palace, photographed by Mr. Nigel Norman with a Williamson Pistol Camera. If you fly over the North Tower (on left) in line with the South Tower, and switch off in about three minutes, you alight in Croydon Aerodrome.

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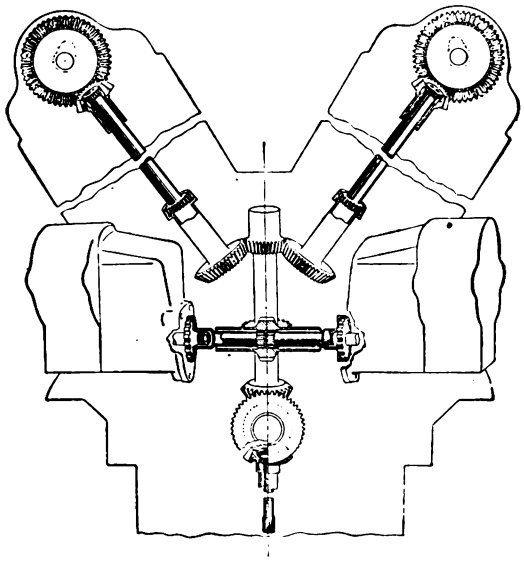

ADVANTAGES OF THE ROLLS-ROYCE 'F' AND 'H' ENGINES

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THE SOUTH ATLANTIC MAIL.

On May 13 M. Jean Mermoz, of the Compagnie Général Aéropostale, alighted on the harbour at Port Natal, Brazil, after a non-stop flight with mails from St. Louis, Sénégal. The Latécoère 28 monoplane, with 600 h.p. Hispano-Suiza engine and float undercarriage, made the journey of 2,150 miles in 21 hours 15 min., or an average of just over 100 m.p.h., and was in constant wireless communication with St. Louis, Fernando Noronha, and three vessels which were patrolling the route.

This feat marks the beginning of the first regular air mail service across the South Atlantic, and completes the line of the C.G.A. from Paris to Santiago de Chile, or nearly 15,000 kilometres by air. The frequency of the service is not yet settled, but air crossings should be made each way once a week before long.

The result will be the possibility of bringing Brazil, Argentine, Uruguay, Paraguay and Chile within three to five days of Europe instead of seven or eight days, which is the time taken by combined air and fast packet-boat transit at present, or 17 to 21 days by steamboat.

The mails carried by M. Mermoz to Natal had at that point travelled 4,777 miles in two days, and were at once trans-shipped to another aeroplane for Rio de Janeiro, Montevideo, Buenos Aires and Santiago.

Jean Mermoz is 28 years of age, but has 3,500 flying hours to his credit and a number of extraordinary exploits in commercial aviation. He has twice been captured and ransomed from the Moors on the West Coast of Africa, during duty on the Aéropostale line between Morocco to Dakar, and once he landed and rescued from hostile natives another pilot whose machine had been forced down.

He inaugurated the night-flying service in Argentina over most difficult country. His adventures among the mountains of South America include one occasion on which he saved his machine and passenger from rolling over a precipice by jumping out and using his body as a chock, and another on which he was stranded for three days in the Andes at an altitude of 13,000 ft., but took off downhill without assistance. He holds the Gold Medal of the Aero Club of France.

The navigator, M. Dabry, is an expert on the aerial application of this science, and M. Gidie, the wireless operator, was in constant communication with both sides of the Atlantic throughout the flight.

On behalf of all good British sportsmen one tenders hearty congratulations to MM. Mermoz, Dabry, and Gimie, and to the C.G.A., and to the Latécoère Company, and to our old friends Hispano-Suiza, on having combined to perform a feat which marks a new epoch in the history of the World's aviation.—C. G. G.

THE GERMAN AIR ESTIMATES.

The Berlin correspondent of *The Times* reports on May 15 that the Reichstag Budget Committee has just discussed the Air Estimates, which as Germany has no military air force, provide only for the needs of Civil Aviation. The 1930 estimates as presented amount to 42,403,500 m. (£2,120,170) as against 27,961,612 m. (£1,398,000) voted in 1929, when a supplementary Budget, however, added another 10,775,000 m. (£538,000).

About three-fourths of the amount estimated is allotted in subsidies to the aircraft industry and to air transport. The industry receives, if the estimates are passed unaltered, 12,445,000 m. (£622,250)—5,445,000 m. for technical research and development, and 7,000,000 m. for its "economic furtherance." Air transport receives, hrough the Luft Hansa 19,000,000 m. (£950,000)—16,000,000 m. for European services, and 3,000,000 m. for services to the East or America. An amount of 3,150,000 m. (£157,500) goes to the Zeppelin works for airship construction.

The Minister for Communications, Herr von Guerard, said that the German aircraft industry could not compete internationally unless it obtained some substitute for the military contracts which were the backbone of the aircraft industry abroad.

He said with reference to the proposed long-distance routes that the trans-Siberian service would not be economically worth while and that the Moscow-Pekin-Shanghai section led across the emptiest areas in the World. He would not therefore countersign the Luft Hansa contract with the Chinese Government and Chinese Navigation Company. Support should rather be given to the Berlin-Constantinople-Angora-Baghdad route which would eventually connect with the British lines to India and possibly Australia. The second service to be supported must be the route to South America.

A Ministerial spokesman said that financial help towards the export of German aircraft was proposed. He mentioned a figure of 2,000,000 m. (£100,000).

The Times correspondent says that the Minister's statement might be read as a plain hint to Moscow that German patience is not inexhaustible, for Luft Hansa have vainly tried for years to get Soviet agreement to the opening of a trans-Siberian service.

A ROYAL ENTRY FOR THE KING'S CUP.

THE AEROPLANE has been unable to get official confirmation of the report that H.R.H. the Prince of Wales is to enter a Hawker Tomtit (Armstrong Siddeley Mongoose engine) for the King's Cup Race, or that his pilot will be Sq. Ldr. Don. But much less likely things have happened.

If the Prince should enter a machine of his own the entry would be a happy omen for the Sport of Flying.

MISS JOHNSON'S FLIGHT.

Bad luck, at least as compared with smiles of fortune on the first week of her flight, descended on Miss Amy Johnson in her effort to fly to Australia in fast time soon after she left Calcutta. The subsequent weather lived up to is evil reputation at this season of the year.

As far as Akyab all went well, but from then on torrential rains and practically no visibility combined to test her nerve and concentration to the utmost. With a pertinacity that would have done credit to far more experienced pilots Miss Johnson kept to her course, and when she reached Insein, some miles north of Rangoon, she thought at first that it was her objective. Some minutes further flight in the storm, during which she failed to find Rangoon, caused her to return and attempt a landing on the small playing fields of Insein. After coming safely to earth the Moth rolled into a small ditch and tipped up, breaking the airscrew and damaging a wing.

Repairs took nearly two days, so that Miss Johnson lost the lead which she had held up to that point over the time taken by Mr. Bert Hinkler. The Moth was taken by motor lorry to Rangoon.

On May 16 Miss Johnson took off from the Race-Course at Rangoon in heavy rain intending to fly to Bangkok, Siam, about 350 miles distant. After a vain attempt to find Moulmein, on the West side of Dawna Range, as a guide to the Three Pagodas Pass, Miss Johnson attempted to cross the mountains by climbing to 9,000 feet and flying blind among the clouds.

After a northern detour in search of clearer weather Miss Johnson found she was still to westward of the mountains, and again searched for Moulmein but without success. A second attempt took her over the Dawna Mountains into Siam, but she was off her map section and flew southward for three hours through rain and clouds before picking up a railway junction which led her to Bangkok.

The repairs made at Rangoon stood up well, but Miss Johnson declared her spare airscrew allowed her engine to run too fast and overheat.

From Bangkok she set out for Singapore on Saturday, May 17, but delays from bad weather decided her to land at Singgora when there was no hope of beating Mr. Hinkler.

The Singgora-Singapore leg was successfully flown on May 18, and Miss Johnson, escorted by two seaplanes of the Singapore Flying Club, arrived over the city, and then landed at Seletar Aerodrome. A new wing was fitted by the Club to replace the one damaged at Rangoon.

On May 19 Miss Johnson landed on a sugar estate known as Tjomal, some miles east of Tegal on the island of Java. She had intended to reach Sourabaya but ran short of fuel and had to find a landing ground after flying 800 miles.

The shortage of petrol seems to be caused by the unsuitable airscrew allowing the engine to run too fast. Under such circumstances her chances of getting successfully over the long and dangerous last stage from Bima to Darwin are bad enough to justify considerable anxiety. But, if this story of the airscrew be true, some inquiry should be made about why she was allowed to take it.

THE DEATH OF DR. NANSEN.

Dr. Fridtjof Nansen, who died at the age of 68 on May 13, will chiefly be remembered as an Arctic explorer of exceptional ability, although he was a notable scientist, diplomat and public figure. He took a leading part in the separation of Norway from Sweden and in November 1905 he was appointed Norwegian Minister in London, a post which he filled with distinction until 1908. He was created G.C.V.O. in 1906.

After the War 1914-18 he became a firm supporter of the League of Nations. He became famous for his famine-relief work and settlement of refugees.

He was one of the founders of the international society to prosecute scientific research from the air and he had planned to lead an expedition which should survey the North Polar Basin. The *Graf Zeppelin* was to have been used, but various difficulties with insurance cropped up.

Dr. Nansen was to have read a paper on "The Aims and Objects of the Aero-Arctic" before the Royal Aeronautical Society on Mar. 14, but had to cancel the engagement.

As a man his personal charm won for him hosts of friends even among those who realised the craziness of his unpractical ideas. And the same force of character which drove him and his men through his needless polar explorations drove many otherwise sane people to support him in his impossibly altruistic social ideas.—C. G. G.

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, May 13.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—Flt. Lt. G. C. Stemp (Lt., The Buffs, R.A.R.O.) is granted a perm. comn. in this rank (May 1); Lt. A. M. Rundle, R.N., is re-attached to the R.A.F. as a Flg. Off. with effect from Apr. 30, and with seniority of June 16, 1924.

The following are promoted with effect from May 14:—

FLIGHT LIEUTENANTS TO BE SQUADRON LEADERS.—A. W. Fletcher, O.B.E., D.F.C., A.F.C., F. A. Norton, G. M. Lawson, M.C., G. A. H. Pidcock, S. S. Benson, A.F.C., P. C. Wood, A. C. Collier (Act. Squadron Leader), G. C. Gardiner, D.F.C.

FLYING OFFICERS TO BE FLIGHT LIEUTENANTS.—A. E. Groom, D.S.M., R. L. Edward, J. R. Brown, D.F.C., L. H. Brooke, H. W. A. Fox (Hon. Flt. Lt.), A. H. Wheeler, G. D. Green, J. H. Woodin, C. C. Edwards, C. J. K. Coggle, N. A. West, R. J. A. Ford, R. G. Hart, M.C., W. H. Burbury, H. L. Drake, J. A. Tindall, A. C. Evans-Evans, C. F. C. Coaker, J. R. Addams,, H. R. Bardon, N. S. Allinson, W. M. C. Kennedy, J. G. D. Armour, J. E. W. Bowles, T. P. P. F. Fagan, C. W. L. Trusk, A.F.C., G. W. Tuttle, P. R. Barwell, P. V. Williams, R. Costa, T. H. Perry-Keene, G. H. Loughnan, F. C. Rowland, A. H. W. J. Cocks, G. W. Hayes, L. W. Cannon, H. H. V. Tristem, G. E. D. Lywood, G. M. E. Shaw, A. J. Holmes, L. Dalton-Morris, F. S. O'Hanlon, L. T. Pankhurst, J. S. Blomfield, E. E. Fallick, D. H. Gibbon.

The following Pilot Officers on probation are confirmed in rank:—M. P. O'Reilly (Feb. 28); J. D. Baker-Carr, R. C. Dawkins, R. F. Fletcher, B. J. Hurren, G. B. Keily, C. R. Lousada, H. L. Messiter, J. S. D. Miles, C. V. Ogden, G. J. Pawson, H. A. Shotter, A. J. Tunnard (Mar. 15); C. Sarsfield-Sampson (Mar. 24); F. Lemon, V. C. F. Streatfeild, E. A. H. Tanner (Apr. 10); E. H. Bellairs, H. R. Black, E. L. Brackenbury, W. K. Brett, E. H. Coleman, E. E. Ellison, R. Ellison, G. Farnhill, G. D. Fleming, K. D. Knocker, J. E. Loverseed, L. McHardy, W. R. A. Matheson, P. R. May, E. J. K. Megaw, D. A. Messiter, V. B. Myers, L. F. H. Orr, M. E. M, Perkins, G. W. Phillips, M. V. Ridgeway, N. C. Singer, H. C. Singleton, A. E. Smith, R. Todd, M. Watson, F. Whittingham, D. H. G. Wood (Apr. 13).

The following Plt. Offs. are promoted to the rank of Flg. Off.:—E. J. Finnegan, T. Gadd (Apr. 12); C. E. W. N. C. Pelly, R. W. Wallace (May 2).

Flt. Lt. A. H. Goldie is placed on the retired list (May 12); Flg. Off. A. V. Harvey is transferred to the Reserve, Class C (May 7).

The following cease to be attached to the R.A.F. on return to Naval duty:—Lt. R. R. Graham, R.N., Flt. Lt., R.A.F. (Apr. 22); Lt.-Cdr. F. W. H. Clarke, R.N., Flt. Lt., R.A.F. (Apr. 25).

The following relinquish the short service commissions on completion of service (May 14):—Flt. Lt. S. P. George; Flg. Off. H. V. Smith, D.C.M. (Lt., Sherwood Foresters, R.A.R.O.).

MEDICAL BRANCH.—Flt. Lt. (Quartermaster) J. M. Maxwell is promoted to the rank of Squadron Leader (May 9).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted commissions in Class AA (ii.) as Plt. Offs. on probation:—B. E. A. Pollard-Urquhart Mar. 19); N. J. Tindal (Apr. 29). K. R. Boulton is granted a commission in Class A as a Pilot Officer on probation (May 6).

The following Plt. Offs. on probation are confirmed in rank:—J. A. Ingles, S. H. R. Clarke (Apr. 11); G. A. Hornblower (Apr. 12); P. O. Hordern (April 15); C. G. Fraser, J. E. Walker (May 6); E. G. Curtice (May 9).

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—The following to be Plt. Off.:—H. Land (Feb. 27).

Appointments.

Week ending May 20.

GENERAL DUTIES BRANCH.—Wing Commanders D. Harries, A.F.C., and J. Sowrey, A.F.C., to R.A.F. Depot, Uxbridge, whilst attending course at Senior Officers' School, Sheerness, 5/5.

Squadron Leader J. Noakes, A.F.C., M.M., to R.A.F. Depot, Uxbridge, 9/5.

Flight Lieutenants R. C. Savery, D.F.C., to No. 9 Sqdn., Manston, 10/5. P. R. T. J. M. I. C. Chamberlayne, A.F.C., to R.A.F., Training Base, Leuchars, 10/5. N. C. Saward, to No. 54 Sqdn, Hornchurch, 8/5.

Flight Lieutenants D. S. Earp, D.F.C., to No. 22 Sqdn., Martlesham Heath, 6/5. A. L. Paxton, D.F.C., to R.A.F. College, Cranwell, 9/5. F. W. Moxham, to No. 54 Sqdn., Hornchurch, 7/5.

Flying Officers E. G. L. Russell, to R.A.F. Depot, Uxbridge, 2/5. J. V. Yonge, to No. 1 F.T.S., Netheravon, 5/5. A. Maughan, to Packing Depot, Sealand, 13/5. N. X. Sheldrick, to C.F.S., Wittering, 5/5. E. S. Finch, to C.F.S., Wittering, 12/5. G. J. Powell, to No. 608 Sqdn., Thornaby, 13/5. R. J. D. Drummond to R.A.F. Base, Gosport, 12/5. J. B. Mackenzie, to R.A.F. Depot, Uxbridge, 1/5.

Pilot Officers B. A. Oakley, to No. 36 Sqdn., Donibristle, 13/5. D. J. Douthwaite, to R.A.F. Base, Gosport, 11/5. R. C. Keary, to R.A.F. Base, Gosport, 11/5. R. D. Cotton, to No. 32 Sqdn., Kenley, 8/5. G. D. Hoyland, to No. 33 Sqdn., Eastchurch, 28/4. E. F. J. L'Estrange, to R.A.F. Depot, Uxbridge, 1/5. D. Carr, W. J. Scott, and J. H. Bell, to No. 3 F.T.S., Grantham, 26/4.

MEDICAL BRANCH.—Flight Lieutenant P. D. Barling, to No. 3 F.T.S., Grantham, 23/6.

Flying Officer A. H. Barzilay, to Station H.Q., Hawkinge, 17/5.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Ali Masjid, near Peshawar, to a Bristol Fighter machine of No. 20 (Army Co-operation) Sqdn., Peshawar, on May 14, 1930, Flt. Lt. James Charles Henry Tavendale, the pilot of the aircraft, and No. 363555 L-AC. Henry John Chapell, were killed.

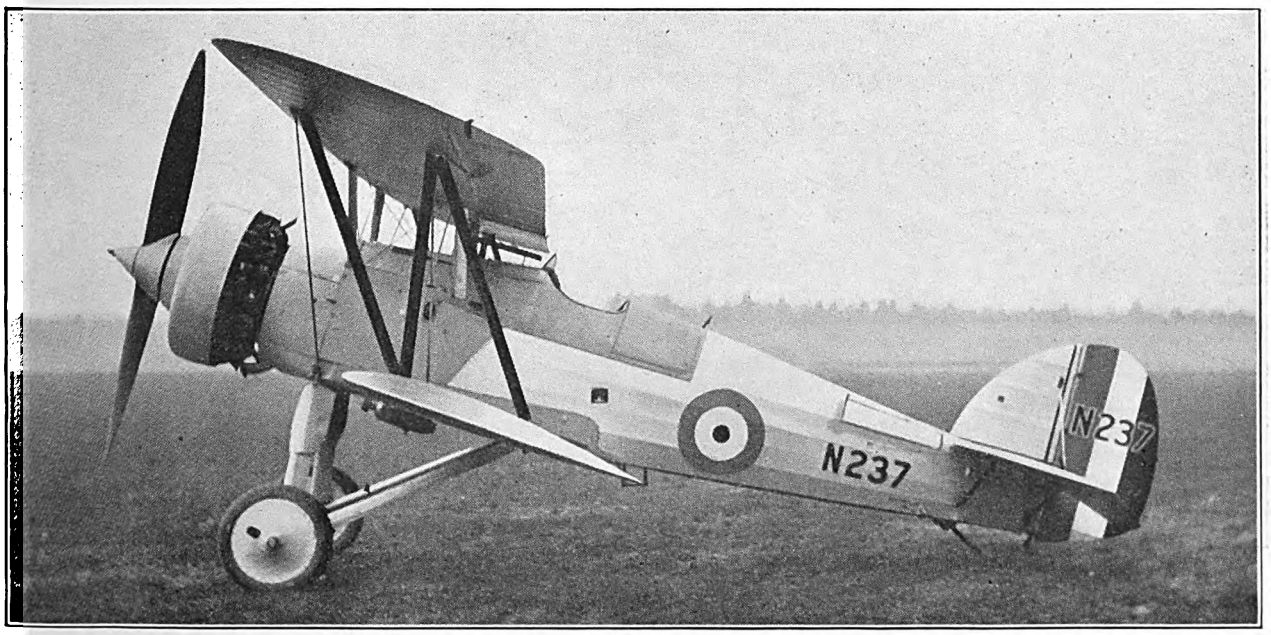
The Air Ministry regrets to announce that as the result of an accident at Kai-Tak to a Fairey III.F machine of No. 440 (Fleet Spotter Reconnaissance) Flight, attached to H.M.S. *Hermes,* China Station, on May 15, 362987 L-AC. Alfred John Jarvis, one of the three occupants of the aircraft, was killed. The pilot and the other occupant of the aircraft were not injured.

The Air Ministry regrets to announce that as a result of the accident at Jhelum, India, to a Bristol Fighter machine of No. 20 (Army Co-operation) Squadron, Peshawar, on May 5, Flg. Off. John William Hawke, the pilot of the aircraft, who was previously reported seriously injured, died in hospital on May 15.

The Air Ministry regrets to announce that as the result of an accident at Risalpur, to a Wapiti machine of No. 11 (Bomber) Squadron, Risalpur, on May 17, Flg. Off. Richard William Alexander Stroud, the pilot of the aircraft, was killed, and No. 364367, AC.1. Charles Samuel Wiltshire, died later of injuries.

The Set Piece at the R.A.F. Display.

In the House of Commons on May 14, in reply to a question by Mr. Mander, the Under-Secretary of State for



A NEW FLEET FIGHTER.—The Hawker Hoopoe (Jaguar VIII) single-seat Fleet Fighter.

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Air said that the programme for the R.A.F. Display had now been settled, and that there would again be a set piece, which this year would illustrate air action undertaken by this country against certain pirates in full conformity with, though not arising out of, its obligations under the Covenant of the League of Nations and the Kellogg Pact.

[For this the Air Staff, Plans and Operations, Intelligence, and all Departments concerned deserve full marks plus a bonus.—C. G. G.]

Examinations for Specialisation.

An Air Ministry Order states that the next examination for specialisation of Short Service officers of the General Duties Branch will be held on Dec. 2 and 3, 1930. The number of vacancies offered for competition on this occasion are, Aeronautical Engineering 15: Signals 4: Armament 1.

Officers competing in this examination must be fit for full flying duties and must, on Aug. 1, 1931, be under 26 years of age and have completed three years' service on a short-service commission. No officer's name is to be included in the list of candidates unless he is eligible under these conditions and is recommended as in all respects suitable to hold a permanent commission and to specialise.

Special Assessments.

The following officers have been awarded the special assessment, Distinguished Pass, on completion of a course of *ab initio* flying training at the R.A.F. Training Base, Leuchars:—

Lieutenants, R.N., Flying Officers, R.A.F.—T. G. Carey, A. J. Tillard, G. K. Martyn.

Notations have been made in the official records of the officers concerned.

The Wearing of Plain Clothes.

In the House of Commons on May 14, in reply to a question by Colonel Howard Bury, the Under-Secretary of State for Air said that the present regulations in the R.A.F. in regard to the wearing of plain clothes approximated to those of the Navy. In view, however, of further representations which had been made to him recently, the Secretary of State for Air proposed shortly to bring the whole question again under review.

The Glasgow Aerodrome.

In the House of Commons on May 14, in reply to a question by Mr. Maclean, the Secretary of State for Air said that negotiations in connection with the acquisition of Abbot's Inch aerodrome were not yet complete. In reply to a further question, Mr. Montague said that the Secretary of State for Air, although he had every desire to help the Corporation of Glasgow and had interested himself personally in the correspondence in which various suggestions for meeting the difficulty had been made by the Air Ministry, he considered nevertheless that it was his duty to retain Abbot's Inch for the use of the Auxiliary Air Force.

Promotion Examinations.

The following officers have successfully passed Promotion Examinations "B," "C," "E" and "F," which were held on Feb. 4, 5, 6, and 7, 1930:—

PROMOTION EXAMINATION "B."

Flying Officers:—Abrams, W. G., Allen, A., Allinson, N. S., Armour, J. G. D., Ashton-Jinks, C. P., *Atcherley, D. F. W., Barwell, P.R., Bennett, L. C., Bennett, R. R., Bett, A. P., *Brake, K. S., Brooke, L. H., Buckle, N. R., Burbury, W. H., Buxton, G. M., Cadell, C. S., Campbell, G. E., Campbell, W. G., Cheshire, W. G., Coaker, C. F. C., *Costa, R., Dalton, Morris, L., Donkin, R. H., Eckersley-Maslin, C. E., Edmondes, M. R., Edwards, R. L., Edwardes Jones, J. H., Evans-Evans, H. A., *Ewens, F. G. H., Fagan, T. P. P. F., Fallick, E. E., Finch, E. S., Fitch, I. J., Ford, R. J. A., Fox, H. W. A., Griffiths, J. F., Groom, E. A., Hall, F. W. H., Hall, R. E., *Hamblin, R. K., Harris, J. H., Hart, R. G., Hatcher, V. G. A., Hayes, G. W., Heard, C. M., Henderson, J. E. Mc. C., Hill, A. E., *Hodder, F. S., Howes, A. M. D., Irving, E. H., John, C. S., Johnson, H. C., Johnson, W. E. P., Jones, J. R., Keary, J. D'A., Lawn, J. F., Legg, R. J., Loch, H. G., Loughnan, G. H., Lowe-Holmes, P. W., Lucas, P. G., Lywood, G. E. G., Martin, H. H., Martin, L. G., May, F. M. V., Mahoney, G. J. C., Merton, W. H., Moloney, T. F., Moritz, P. A., Murray, E. A. T., Owen, A. H., Parker, H. M. G., Parker, K. E., Part, R. F., Pearson Rogers, H. W., Pickard, W. J., Pike, T. G., Pilcher, G. N., Platts, M. A., Pleasance, N. C., Pool, J. H., Purvis, H. A., Rowland, F. C., Shaw, G. H., Shaw, G. M. E., Shenton, R. F., Southey, H. F. G., *Spaight, W. J. M., Spreckley, H. D., Steedman, E. B., Stokes, E. G. C., Stokes, L. R., Tindall, J. A., Tristem, H. H. V., Trusk, C. W. L., Tuttle, G. W., Walker, H. J., Wallis, J. B. M., Ward, E. L. S., West, N. A., Wheeler, A. H., Wisher, H. G., Woledge, C. G. C., Woodin, J. H., Yarde, B. C.

Reserve of Air Force Officers.—Flying Officers:—Browne, T. E. W., Clarkson, C., Debenham, H. G. W., Rimmer, W. F., Vine, L. E.

PROMOTION EXAMINATION "C."

Flight Lieutenants:—Adams, C. D., Allan, D. S., Allen, W. S., Anderson, D. F., Barbour, R. L. McK., Barraclough, C. E., Beardsworth, H. I. T., Bell, J. R., Bilney, C. N. H., Blake, E. A., Bond, F. E., Britton, E. A. C., Caswell, B. B., Chamberlayne, P. R. T. J. M. I. C., Chandler, C. K., Daddo-Langlois, W. J., de Burgh, D. H., De St. Leger, R. J. M., Fletcher, A. W., Flinn, C. H., Glashier, J. M., Gray, J. A., Harrison, J. S., Hatcher, C. J. W., Hay, J. C. M., Heslop, H. W., Hodson, G. S., Holland, R. J. H., Howard, G. V., Hurley, W. M. M., Hyde, W. V., Ivelaw-Chapman, R., Jarvis, L. W., Knowlden, W. E., Long, A. J., MacNab, J. A., Maitland, C. E., Mann, W. E. G., Moody, H. M., Norton, F. A., Oliver, G. R., Pearce, F. L., Pendavis, H. V., Poole, W. H., Purdin, W. E., Rankin, A. J., Ranson, G. E., *Richards, W. J., Ronksley, F. H., Russell, B. H. C., Saker, H. J., Savile, F. C. B., Savile, W. A. B., Smythe, C. R., Staton, W. E., Traill, T. C., Warwick, A. J.

Reserve of Air Force Officers.—Flight Lieutenants:— Clapp, O. W., Bennett-Baggs, J. L. N.

PROMOTION EXAMINATION "E."

Flying Officers:—Bates, L. J. V., Bedford, F. H., Bray, L. L., Dixon, F. E. R., Essex, B. E., Fleming, R. B., Haes, A. E.,

SOCCER IN 'IRAQ.—The winners of the R.A.F. ('Iraq) Senior Association Football Cup 1929-30. From left to right (standing): Cpl. V. Cheeseman (Secretary), Sjt. A. S. Read, Sjt. F. E. Whyte, L-AC. T. L. Davies, L-AC. E. C. Hughes, Cpl. C. J. Young. (Sitting): L-AC. R. Jenkins, Sq. Ldr. E. A. Fawcus (O. i/c. "B" Sqdn.), L-AC. F. J. Gavin, Flt. Lt. C. H. Masters, AC. O. M. Jones. (On the ground): L-AC. G. P. Hall, AC. A. N. Stacey, AC. J. H. Keay.

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Hanson-Abbott, O., Hemsley, B. W., Hesketh, R. N., Horsfield, C. B., Jenks, M. H., Law, N. M., *Ludlow, F. B., Mitchell, J. W., Park L. W., Scarrott, G., Young, J. F.

PROMOTION EXAMINATION "F."

Flight Lieutenants:—Davis, C. T., Denman, J. L., Farley, W. C., Hobbs, J., Honey, W. A. O., James, T. S., Jones, H., Mason, J. V., Masters, C. H., Polden, C. J., Shakeshaft, J. C., Vernon, L. H.

The star against the names of certain officers indicates that they have obtained an aggregate of 80 per cent. or over of the total marks and will receive a special notation in their records.

The Comrades of the Royal Air Force.

Rules and regulations to govern what has been known as the R.A.F. Old Comrades' Association and will be known in future as The Comrades of the Royal Air Force, have been drawn up by the Committee and include the following:—

The objects of the Association are to foster *esprit de corps*, to encourage and promote social gatherings among the members and to render service to one another. The headquarters are to be in London.

Membership of the Association is open to all Officers, Warrant-Officers, Non-Commissioned Officers and Airmen, whether serving or retired, gazetted, attached, seconded or transferred to or enlisted in the Royal Flying Corps, the Royal Naval Air Service, the Auxiliary Air Force and Special Reserve and the Dominion and Colonial Air Forces.

The rates of subscription are Life Membership £5 or Annual Subscription 5s. All subscriptions are to be paid on joining and annual subscriptions thereafter in advance on Jan. 1 of each year.

The President will be elected by the members at the first Annual General Meeting and the Vice-Presidents will be elected first by the Central Committee and in subsequent years by the members at the Annual General Meetings or at Extraordinary General Meetings.

The Central Committee, consisting of a Chairman, Vice-Chairman, Hon. Treasurer, Secretary and eight members will be appointed at the Annual General Meetings and will administer the business of the Association and its funds and will meet at least four times every year.

All freehold and leasehold property and invested funds of the Association are to be vested in the names of three Trustees to be appointed from time to time by the General Meeting.

A General Meeting will be held every year and an Extraordinary General Meeting may be summoned at any time by the Central Committee on fourteen days' notice in writing to Home members and Branches. No alteration or addition can be made to the Rules except under the authority of a three-fourths majority of members present in General Meeting. The Accounts of the Association will be audited and printed together with the Annual Report.

A Branch may be formed on the authority of the Central Committee and must be administered by a President, Vice-Presidents and a Branch Committee. Branch Funds will be administered by the Branch Committee and the accounts of each Branch will be prepared half-yearly and audited by two members to be appointed by the Branch Committee.

Further information about the Comrades of the Royal Air Force can be had from William Coen, R.A.F. Station, Eastchurch, Kent.

AN AUSTRALIAN CATERPILLAR

An *Exchange* message from Melbourne dated May 15 states:—

The pilot of an Air Force Bristol Bulldog fighter machine escaped unhurt by parachute when the wing of the machine collapsed while he was carrying out aerobatics. The aeroplane crashed and was wrecked. This is the first accident of its kind in Australia.

EXAMINATIONS FOR AIR NAVIGATORS.

An examination for Second Class Air Navigators' Licences will be held, in London only, at the Air Ministry, Gwydyr House, Whitehall, on Monday, Tuesday, and Wednesday, July 7, 8, and 9, 1930.

Application forms, the syllabus, and conditions of examination may be obtained on application to the Secretary, Air Ministry (C.A.2), Gwydyr House, Whitehall, London, S.W.1.

Formal applications to sit at this examination must be made on Form C.A.2.c, and, together with the prescribed fees, must be received at the above address not later than Tuesday, June 17, 1930.

Before a licence can be issued, candidates will have to pass the prescribed medical examination. Arrangements can be made for the special medical examination at the Central Medical Board to take place on Wednesday afternoon, July 9, 1930, if early application is made to be examined on that day. Otherwise special arrangements will be made.

BRITISH AIRCRAFT FOR THE BUENOS AIRES EXHIBITION.

In the House of Commons on May 14, in reply to a question by Mr. Matters, the Under-Secretary of State for Air said that the Royal Aero Club had been informed that the Schneider Trophy seaplanes were available on certain terms for the purpose of taking part in the Schneider Trophy Contest of 1931 and until it was known whether they were wanted it was not possible to make any arrangements for their being sent to Buenos Aires for demonstration flights in connection with the British Empire Manufactures Exhibition to be held in the Argentine capital next year.

Mr. Matters asked Mr. Montague to take into consideration the fact that an aircraft-carrier was to be sent out there and that these proposed demonstration flights would give a considerable impetus to the sale of British aircraft.

Mr. Montague said that he agreed, but that was a question for the Admiralty.

Captain Cazalet said that this country had never sent an aeroplane of any kind to the Argentine, although every other European country had done spectacular flights there.

[Captain Cazalet is wrong. Many British aeroplanes have been demonstrated in Argentina, but always at the expense of private enterprise.—C. G. G.]

THE AGA KHAN'S PRIZE.

The winner of the Aga Khan's prize for the first solo flight between England and India by an Indian has been announced. He is Mr. Aspy Irani "Engineer," a 17-year old member of the Karachi Aero Club, who recently made the journey from England in his father's D.H. Gipsy-Moth piloted by Mr. Chawla. He has definitely defeated Mr. Man Mohan Singh who exceeded the time limit for the prize, and Mr. Jehangir Tata, who landed at Croydon a day after Mr. Engineer's arrival at Karachi.

Mr. Ram Nath Chawla, with whom Mr. Engineer flew to England, was not eligible for the prize because he did not fly solo, but he has been awarded a special prize of £500 by the Government of India.

So after all the Aga Khan's prize was won by a non-Indian, in that Mr. Aspy Irani Engineer is definitely a Parsee and not any sort of Dravidian.

The curious thing about the educated natives of India is that so few know what they are. Apart from Europeans, Parsees, Pathans and Jews—who as a rule do know their ancestry and are particular about it—the rest seem curiously indifferent. And yet to call a man an Indian is as indefinite as is calling a man a European. In Europe there is a clear distinction in breed between a North Irishman and a South Irishman, and there is a huge racial difference between a Bulgar and a Serb. Actually there is as much difference between one breed of Indian and another, which any uneducated Indian recognises. Semi-education seems to cause a curious kind of stupidity in this matter. And unless a distinction is made an immense amount of money will be wasted in trying to make pilots and mechanics of the wrong breeds.—C. G. G.

SCARCELY TACTFUL.

The French occupation authorities at Trier (Treves) in the course of their preparations for withdrawal, have sold by auction the Zeppelin shed and an aeroplane shed there for about £190. By a recent agreement between the German and French authorities these sheds could have been left for adaptation to civil purposes, subject to a German undertaking to demolish them in three years if they were not so adapted.

THE THIRD TIME LUCKY?

Mr. Smith and Lieut. Shiers, who were attempting to fly in a Ryan monoplane from Australia to England, have abandoned their flight. On April 24 they had a forced landing 40 miles from Bangkok, which so damaged the machine that the aviators have returned to Australia.

Mr. Smith and Lieut. Shiers had a forced landing about 40 miles from Darwin when they were flying up from Sydney, and they were lost for some days. They had a wireless set, which enabled the search parties to locate them very speedily.

IMPORTANT DATES.

May 24.—Aerial Cross-Country Observation Competition of Norfolk and Norwich Aero Club.

May 29—June 14.—Royal Tournament at Olympia.

May 30.—Wilbur Wright Memorial Lecture by Mr. H. R. Ricardo.

May 31.—Bristol Air Pageant (Bristol and Wessex Aeroplane Club). Official opening of Bristol Municipal Aerodrome (with R.A.F. support) and International Club Rally.

June 3.—R.A.F. Middle East Dinner.

June 9.—N.F.S. Meeting at Reading.

June 9.—Northamptonshire Aero Club's Meeting at Sywell.

June 10—15.—F.A.I. Conference, Paris.

June 14.—Manston Garden Party.

June 19.—N.F.S. Meeting at Nottingham.

June 21.—Annual Air Rallye at Haldon Aerodrome.

June 21.—Competition for the Gywnn Maddocks Cup at Heston.

June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.

June 27.—Annual Dinner, R.A.F. Dinner Club.

June 28.—Royal Air Force Display at Hendon.

July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).

July 9—12.—R.A.F. Athletic Championships at Uxbridge.

July 13.—N.F.S. Meeting at Leeds.

July 19.—Hanworth Garden Party.

July 20—Aug. 7.—International Touring Competition, starting from Berlin.

July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).

Sept. 1—6.—International Congress on Air Navigation at the Hague.

Sept. 6.—Official opening of Mr. Lindsay Everard's private aerodrome at Ratcliffe, Leicester.

Sept. 6—28.—International Aero Exhibition at Stockholm.

Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).

Sept. 27.—Air Pageant at Hanworth.

Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

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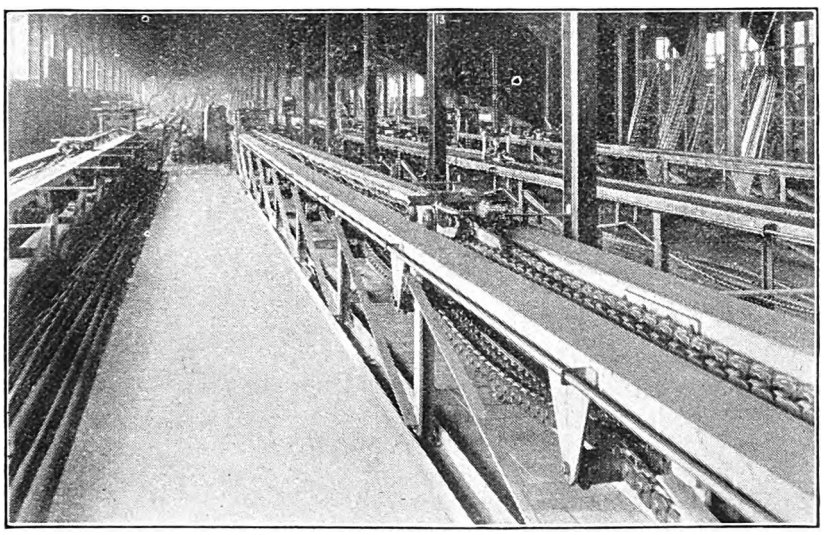
ALL-METAL AIRCRAFT



View of the four draw - benches in the Boulton & Paul Works.

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AS a result of extensive experimental and development work which they have undertaken since the end of the war, Boulton & Paul Ltd. have now brought the art of the metal construction of aircraft not only to a high degree of technical perfection, but also to a stage which renders it possible cheaply and rapidly to produce aircraft of practically any size and type from standardised sections and components, which can readily be manufactured in large quantities, using existing plant and tools and requiring relatively little highly skilled labour for either production or assembly.

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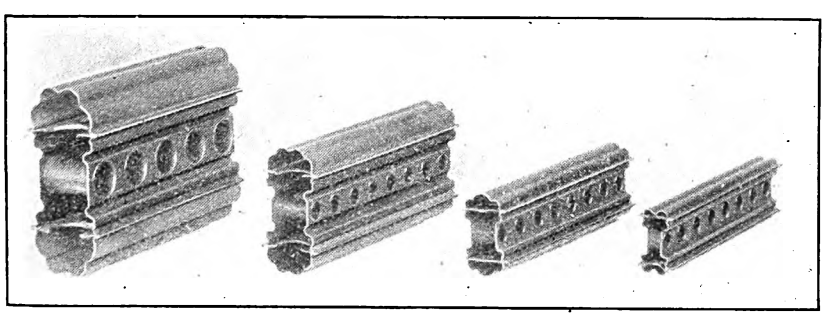

Four of the range of standard steel Spar Sections designed and manufactured by Boulton & Paul Ltd.

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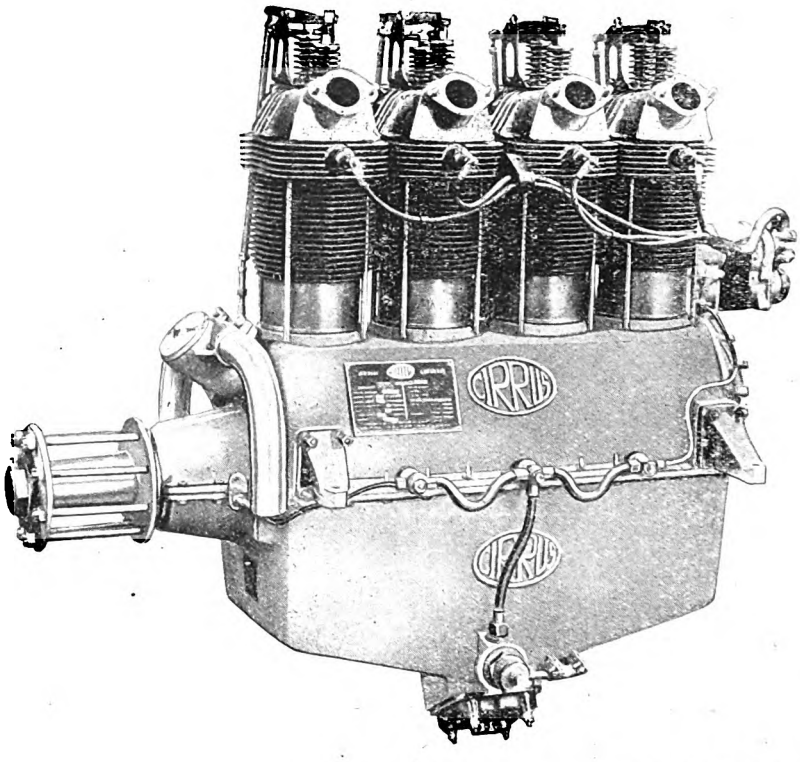
CIRRUS ENGINE



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THE BLUEBIRD SUPPLEMENT.

THE STORY OF THE BLUEBIRD.

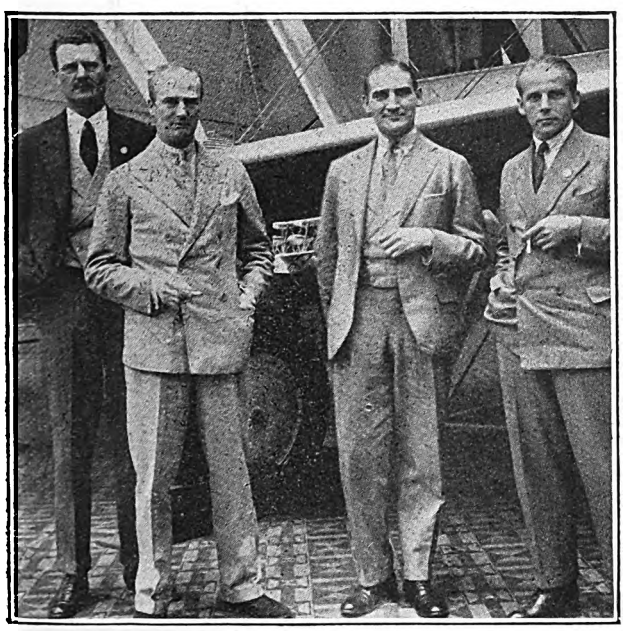
Students of humanity must have some difficulty in deciding whether a constitutional bent for pioneering is a gift or an affliction. Whichever it may be, the man who is a born pioneer will go on pioneering till he dies of old age. Of pioneers the majority die in poverty because the same obstinacy which made them persist in pioneering against the better advice of more commercially-minded people also prevents them from taking the good advice which would persuade them to sell the achievements of their pioneering when the period of pioneering is past and the period of commercialism has arrived.

Fortunately there are some, of whom there are happily several outstanding examples in the Aircraft Industry, who, having pioneered in the beginning, have had a commercial instinct which has inspired them to make money out of their first pioneering efforts and then to continue to pioneer other phases in the development of their own particular trade, business, or profession. And they have made good at each successive step. Of them, few have been so successful as has Mr. Robert Blackburn, of the Blackburn Aeroplane and Motor Co. Ltd., formerly of Olympia, Leeds and now of Brough, near Hull, Yorks.

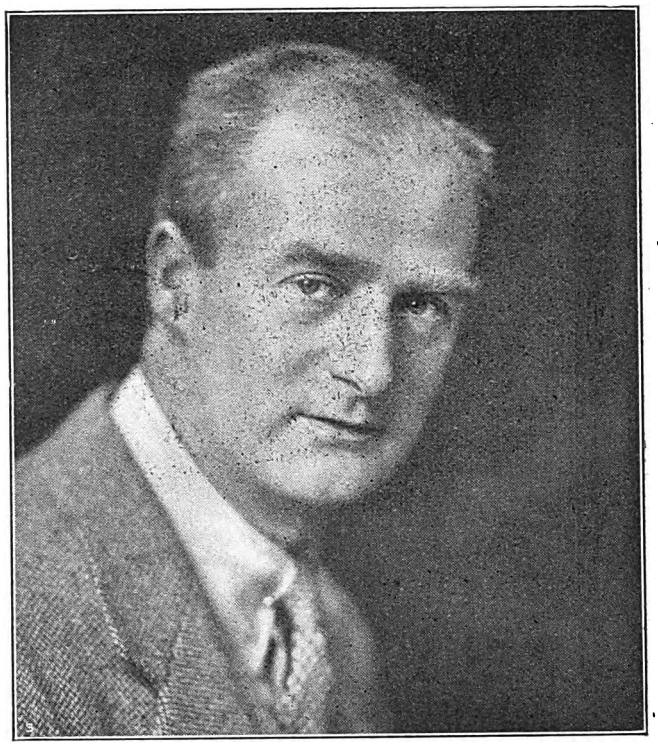
Mr. Blackburn's first aeronautical experiments began somewhere about 1908, and he definitely got off the ground on one of his early experiments at Filey Beach somewhere about 1909. From those early experiments he developed the graceful Blackburn monoplanes of 1911-12 and thereabouts, which were made famous by the late B. C. Hucks, by Mr. Harold Blackburn, who recently retired from the R.A.F. as a Wing Commander, and by Mr. M. G. Christie, who more recently retired as a Group Captain.

With the outbreak of War in 1914 the Blackburn Co. developed into a really great manufacturing concern, at Leeds and at Brough, and, conducted as it was with true Yorkshire thoroughness and the Yorkshireman's natural ability in engineering, the output of the Blackburn factories was recognised as being quite in the first class.

Towards the end of the War, when the Royal Naval Air Service was endeavouring to impress the Royal Navy with the value of work which it had in fact been doing before the War, the Blackburn Company did more pioneering work in making with marked success some of the earliest torpedo-dropping aeroplanes. And when Peace broke out the Blackburn Company, almost alone among the aircraft manufacturers of the World, continued to develop torpedo-droppers, with the result that for some years Blackburn aeroplanes have been the standard torpedo-dropping aeroplanes of the Fleet Air Arm.



A FAMILY PARTY.—Left to right, Brig.-Gen. Francis Festing (foreign representative), Mr. Robert Blackburn, **Mr. Charles Blackburn and Mr. Reginald Rhodes (Directors).**



THE PIONEER.—Mr. Robert Blackburn.

With these Blackburn torpedo machines much of the pioneer experimental work in deck-landing and flying-off decks was done, so here again the Blackburn Co. have another branch of pioneering to their credit.

In 1924, when things were just beginning to settle after the post-War slump, and when light aeroplanes were first introduced to the World, naturally Mr. Blackburn had to be in the movement, and so the first Blackburn Bluebird was produced for the Light Aeroplane Competition at Lympne in September of that year. It had a small three-cylinder radial engine, and owing to various troubles with it the machines did not take part in the meeting.

Various developments in the Bluebird were made during 1925. Engine troubles kept it from appearing at the Air Ministry's Two-Seater Light Aeroplane Competition, and until 1926 it did not visit the South of England. The machine entered for the 1926 Meeting had a five-cylinder 60 h.p. Armstrong Siddeley Genet engine and in general lay-out it resembled the type of to-day,—but its estimated maximum speed in those days was 75 m.p.h. and its landing speed was 35 m.p.h.

On Sept. 18 a Bluebird with a Genet engine, piloted by Sq. Ldr. Longton, won the Grosvenor Cup at a speed of 84.95 m.p.h. round the course. Which shows how the calculated speed was underestimated.

The Bluebird ended the year 1926 by an unusual distinction in that it took an officer of the Royal Air Force and his bride for a honeymoon tour in France in December.

In 1927 the Blackburn Company decided to develop the machine on a production basis and the first production machine appeared in March. The design for this machine also included a float undercarriage.

In the Easter week-end Meeting at Bournemouth in 1927 the Bluebird piloted by Sq. Ldr. Longton won a first, second and third prize, and showed itself to have a very nice turn of speed.

During this year the Bluebird achieved quite a remarkable degree of popularity. With its side-by-side seating and raised top plane giving a good view forward and sideways it was very much liked by all those who had the chance of trying it.

It was adopted as the standard training equipment of the Suffolk and Eastern Counties Aeroplane Club, and Serjeant Lowdell, who was acting as voluntary instructor before he

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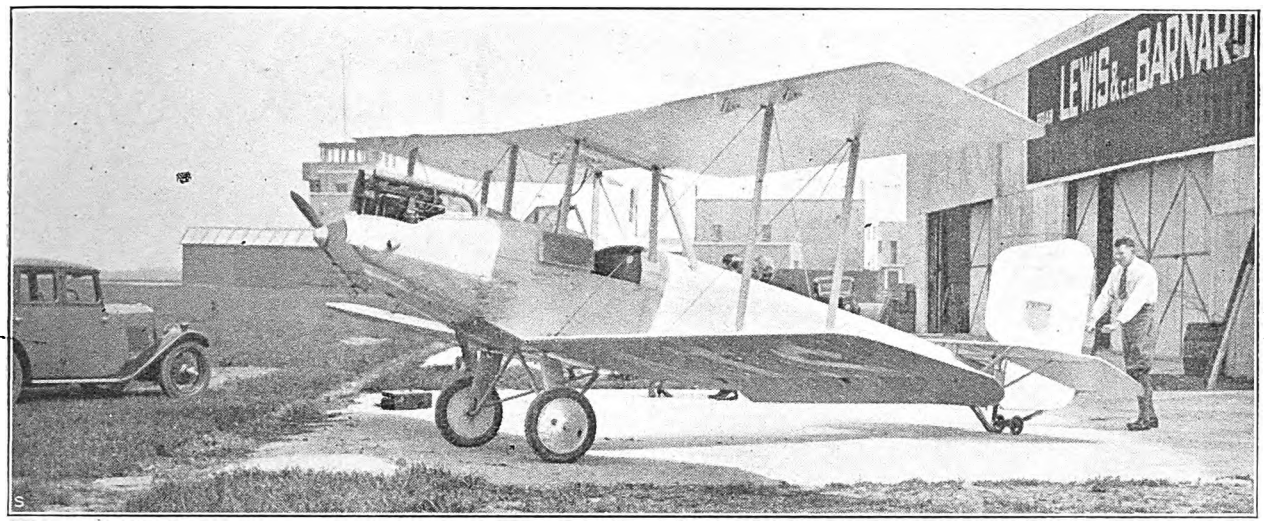


THE OWNER-DRIVER.—A proud proprietor bringing out his Bluebird at Heston.

alighted on the Thames opposite the Savoy Hotel and with his passenger came ashore for the lunch.

In May of 1929 arrangements were made with that famous motor-car firm known as Auto-Auctions Ltd. that they should take over the wholesale and retail sales of the Bluebird.

The Managing Director of Auto-Auctions Ltd., Mr. L. T. R. Ridley, will be remembered by all the pre-War Brooklands people as a racing driver of ability and as a fervent follower of aviation, though he was not himself a pilot. With him, in control of the new aircraft side of Auto-Auctions Ltd., is his brother, Sq. Ldr. C. A. Ridley, D.S.O., M.C., who retired from the R.A.F. early in 1929 to devote himself to the civil side of aviation, where his intimate knowledge of all types of aircraft should be of high value.

Until the early part of 1929 Auto-Auctions Ltd. had occupied large premises in the Horseferry Road, Westminster, but at this period they took over show-rooms at the corner of Burlington Gardens and Old Burlington Street, a point which may well be regarded as the geographical centre of the social side of London. Everybody of importance who ever comes to London finds himself or herself sooner rather than later in that area limited by Bond Street, Oxford Street, Sackville Street and Piccadilly, so no more convenient part of London could be imagined for business with people of the class who are most likely to buy aircraft.

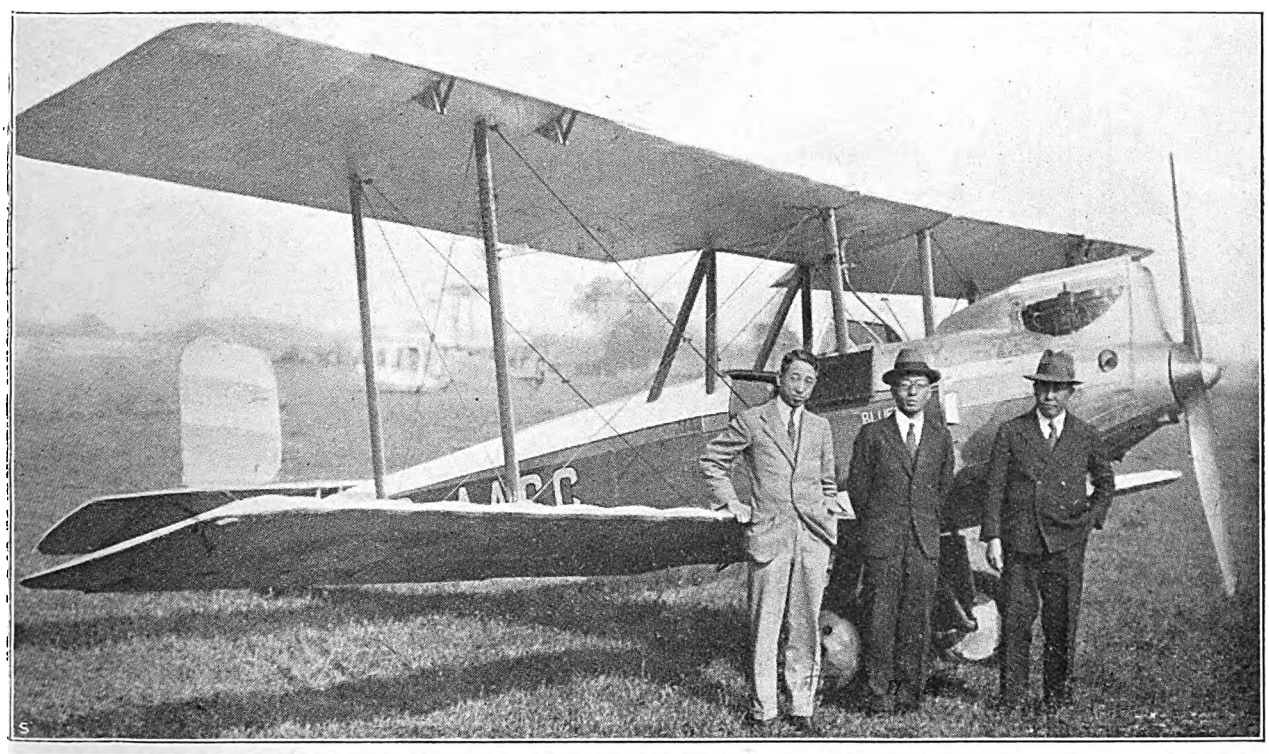
Auto-Auctions Ltd. set about their aircraft business thoroughly, for they engaged shed accommodation at Heston Air-Park, which may certainly be regarded as the particular haunt of the best people concerned with aviation, besides being the aerodrome which can be reached most quickly from the West End of London.

They opened their premises at Burlington Gardens by showing one of the new all-metal Bluebirds with a Cirrus III engine. It attracted a great amount of attention and much favourable comment.

Just about this same period the Blackburn Company made arrangements with Saunders-Roe Ltd. to take over the production of the Bluebirds, so that the output of light aeroplanes might be entirely dissociated from their output of War machines and big flying-boats.

This has turned out to be a very good arrangement for naturally the class of workmanship turned out under the critical eyes of Sir Alliott Roe, Mr. S. E. Saunders and Mr. John Lord has to be of the very finest. Also, works which are under the immediate supervision of Mr. H. E. Broadsmith can always be depended on to produce aircraft of the best class.

Since then the Bluebird has gone on steadily doing good work. It has not distinguished itself in speed events, for it does not set up to be a speed machine. But it has a very comfortable touring speed and it has been largely used for touring. Everybody who has used Bluebirds has been thoroughly satisfied with their behaviour. They have proved themselves staunch and well-found and in every way they have upheld the best traditions of British aircraft design and construction.—C. G. G.



THE FIRST SLOTTED BLUEBIRD.—A sample machine with Handley Page slots and Cirrus engine supplied to the Mitsubishi Company in Japan.

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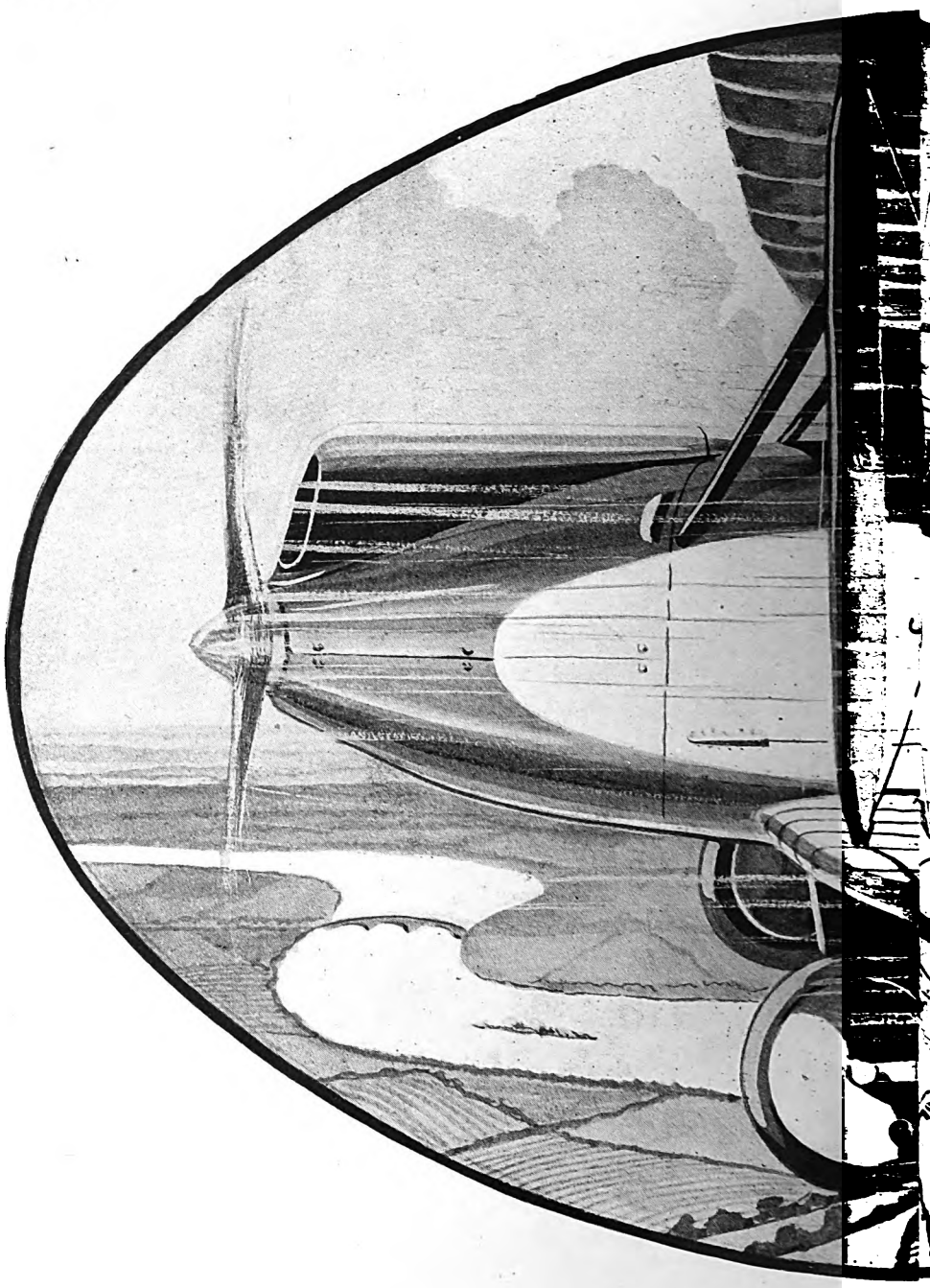
"Practically every great flight in the history of light aeroplanes has been performed with an engine of Cirrus make."—*Flight*, Mar. 1930.



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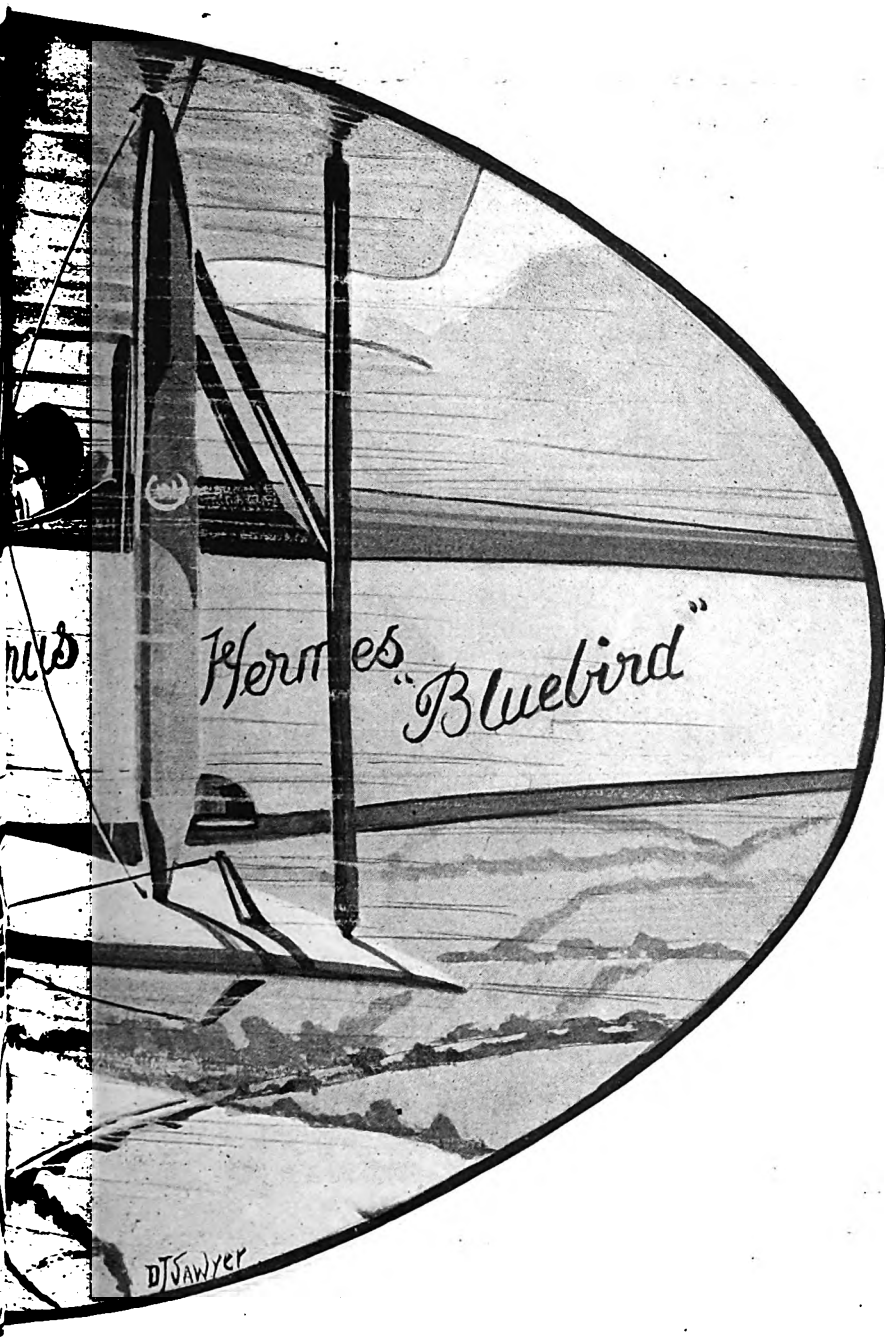
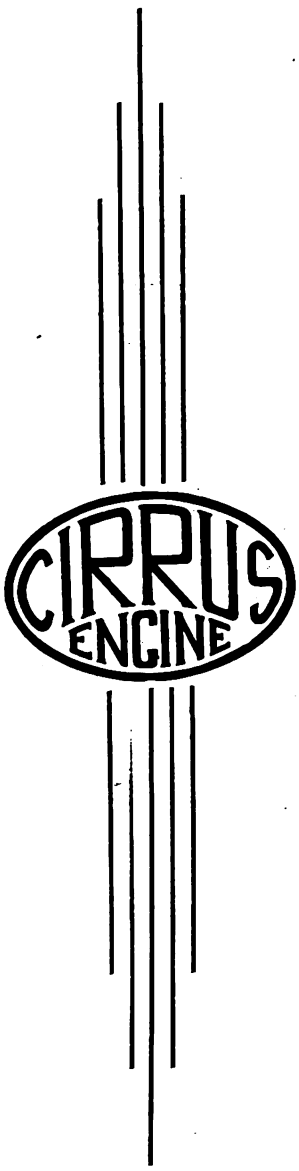
"This engine is installed as standard, or as an alternative, in nearly every light aeroplane in the world."—*Air*, May 1930.





"The engine which made the light aeroplane of to-day possible."—*The Times* (Eng. Supt.)

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THE ALL-METAL BLUEBIRD.

The all-metal Blackburn Bluebird, which is the fourth Mark of its type, began its career very auspiciously in the early months of 1929. The first machine of the new type was put in the air on Feb. 23 of that year. Shortly afterwards Sq. Ldr. Slatter, O.B.E., D.S.C., D.F.C., R.A.F., left Stag Lane in this machine for Durban, South Africa, where he arrived on April 15. There is no record of such a performance before or since with the first of a type designed for production so soon after leaving the works. The designers and constructors had a right to feel that their creation had entirely fulfilled their hopes by achieving a flight of such duration immediately after leaving their care.

The particular appeal of the Bluebird was well illustrated with one of the earlier types when an officer of the R.A.F. and his bride flew to Paris, and France generally, in a Bluebird for their honeymoon. This early trip drew attention to the companionableness of the side-by-side seating arrangement and car-like comfort of the big cockpit. The flight to Africa demonstrated the ability of the production machine to carry to a successful conclusion difficult transcontinental journeys made under the greatest variety of climatic conditions.

The side-by-side seating is particularly liked by many instructors for training purposes, because the instructor can watch his pupil closely and notice all his or her reactions. The same feature will, as pointed out elsewhere, appeal to the private owner who has been educated of late to a high degree of comfort in the motor-car, especially in the more powerful breeds of automobile. The neatly upholstered cockpit and absence of any visible mechanical gadgets are a definite attraction.

The Blackburn Bluebird is the only completely metallised two-seat light aeroplane on the British market and has been designed for ease of maintenance and cheap repair. The all-metal structure makes it particularly applicable for use abroad in climatic extremes.

The wings of the Bluebird are slightly swept back, a feature which makes the type easily recognisable from the ground. The cellule, as the wing-structure is conveniently called in French, is arranged in a single bay on each side and folds back alongside the fuselage in the usual way by withdrawing four pins. Jury struts are fitted for use in this operation.

The ailerons, of the Frise type, are inset from the wing-tips and are in the lower planes only. Fittings are built into the top wings so that Handley Page slots can be fitted as an extra.

The spars of the wings have the normal arrangement of drift-struts and bracing, and are built to an ingenious design described in detail later, as is the equally cunning design of the ribs.

Streamline steel tube is used for all interplane and cabane struts. The centre-section, which is the fuel tank, is supported by four vertical struts and two struts which slope back from the rear spar to the fuselage.

Something has already been said about the thought which has been given to making the Bluebird cheap to maintain and repair. For these reasons the fuselage has been made in four main parts, so that when any portion is damaged, say by a bad landing, one can unbolt the bent portion and replace it with the minimum of trouble.

The forward portion is the engine-mounting, which is an extremely simple structure of duralumin channel and steel tube for the mounting of the four-cylinder-in-line engines. A box plate of duralumin is used for the Genet Major.

The middle section contains the cockpit, and to it are attached the wings. This is built up of duralumin bulkheads with a certain amount of steel tube.

The third part is a very simple tubular structure, to which is attached the tail unit. The forward portion of the fuselage is cowled with aluminium sheet, but aft of the cockpit the fairing is done with longitudinals of specially-shaped duralumin, which are merely sprung into place and covered with fabric. The problem of inspection is thus resolved into its simplest terms.

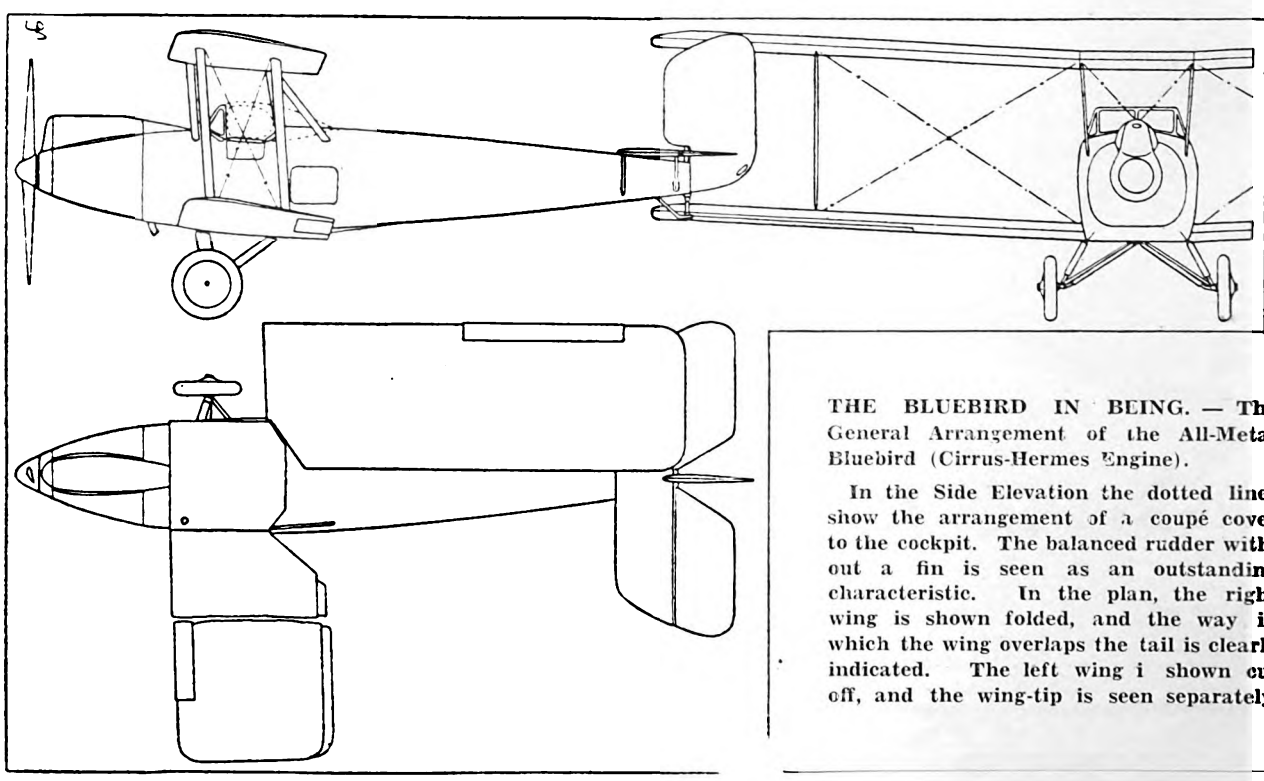
The undercarriage, of the divided-axle type, has been designed for service. Steel springs with oleo-damping are used instead of rubber blocks. The axle and radius rod, which slopes aft, are hinged to fittings on the centre-line. The shock-absorbing legs run up to the wing-root fittings. The tail-skid has a malleable iron wearing shoe, which is mounted on a light alloy casting. This is mounted on a tube which telescopes against a spring inside the stern-post. A radius-rod braces the shoe forward to the fuselage.

The tail-unit is distinctive among light aeroplanes, for a balanced rudder of large area is used, and this requires no fin. The tailplane is adjustable while flying. The front spar is hinged in two gun-metal bushes on uprights from the fuselage and two bushes at the ends of bracing struts. The rear spar is supported on a vertical tube at the rear of the fuselage and on two diagonal bracing-struts the ends of which are attached to the vertical tube. The vertical tube can be lifted up and down by an arrangement of levers and links, and the two diagonal bracing struts move with it.

All the control surfaces at the tail are operated by push-pull rods, which are worked from a lay shaft inside the fuselage. The structure of the tail-unit is duralumin sheet and steel tubing.

Four different power-plants can be had as standard in the Bluebird. These are the 85/95 h.p. Cirrus III, the D.H. Gipsy 90/100 h.p., the 105/115 h.p. Cirrus Hermes, and the 100/110 h.p. Armstrong Siddeley Genet Major.

The fuel feeds by gravity to the engine from the tinned-steel fuel-tank, which forms the centre section. At the back of the sump is a sight-type fuel gauge. The engine controls are very handily arranged at the bottom of the middle of the dash.



THE BLUEBIRD IN BEING. — The General Arrangement of the All-Metal Bluebird (Cirrus-Hermes Engine).

In the Side Elevation the dotted lines show the arrangement of a coupé cover to the cockpit. The balanced rudder without a fin is seen as an outstanding characteristic. In the plan, the right wing is shown folded, and the way in which the wing overlaps the tail is clearly indicated. The left wing i shown cut off, and the wing-tip is seen separately.

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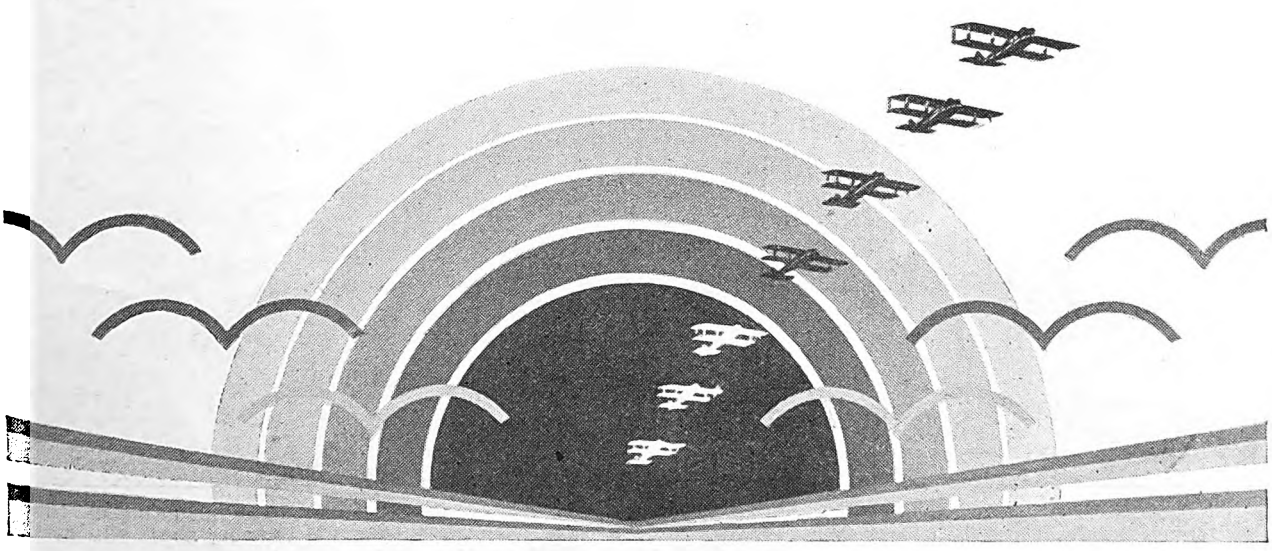

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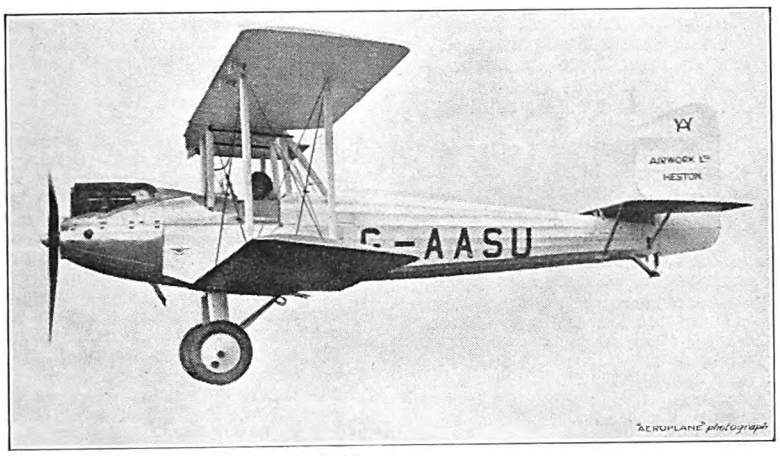
FOR EVERY TYPE OF AERO ENGINE.



The BLUEBIRD.

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the dash, where they can be comfortably seen from either seat. A feature of the cockpit is the manner in which it has been upholstered and floored in. Like a car, the floor surface is quite uncluttered,—the only excrescences are the rudder-bars and the control columns, together with the lever which adjusts the tailplane.

The control system has been so arranged that there are no pulleys. All corners are turned with cranks, levers, push-pull rods and links. The only cables are those which run quite straight and link the various levers together. All moving parts in the control system are arranged for easy lubrication, generally by Tecalemit grease-gun.

The large windscreen keeps draughts out of the cockpit and gives more than adequate protection. The Bluebird can be fitted with a coupé top for all-weather flying.

Just aft of the cockpit is a large locker of particularly encouraging dimensions. Auto-Auctions have had a special suit-case made to fit this. The case costs five guineas and measures 37 in. x 15 in. x 7 in., so that there is heaps of room for one's personal effects. A feature of the suit-case is that in its length trousers can be packed with a minimum of creasing.

The golf-minded can have a long locker for their sticks built as an extra into the top decking behind the cockpit. This locker is equally suitable for guns and other sporting impedimenta.

SPECIFICATION.

DIMENSIONS.—Span 30 ft. (9.144 m.), Chord 4 ft. 6 in. (1.372 m.), Length 23 ft. 2 in. (7,061 m.), Width folded 9 ft. 10 in. (2.997 m.).

WEIGHTS AND LOADINGS.—*Cirrus III—land machine*: Weight empty 1,042 lbs. (472 kgs.), Disposable load 553 lbs. (251 kgs.), Normal weight loaded 1,595 lbs. (723 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,643 lbs. (745 kgs.), Wing loading 5.9 lbs./sq. ft. (28.7 kgs./sq. m.), Power loading 17.7 lbs./h.p. (8.05 kg./h.p.).

D.H. Gipsy—land machine: Weight empty 1,040 lbs. (471 kgs.), Disposable load 553 lbs. (251 kgs.), Normal weight loaded 1,593 lbs. (722 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,750 lbs. (793 kgs.), Wing loading 5.9 lbs./sq. ft. (28.7 kgs./sq. m.), Power loading 17.7 lbs./h.p. (8.05 kgs./h.p.).

Cirrus-Hermes—land machine: Weight empty 1,067 lbs. (483 kgs.), Disposable load 553 lbs. (251 kgs.), Normal weight loaded 1,620 lbs. (734 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,750 lbs. (793 kgs.), Wing loading 6 lbs./sq. ft. (29 kgs./sq.m.), Power loading 15.4 lbs./h.p. (7 kgs./h.p.).

Genet Major—land machine: Weight empty 1,012 lbs. (459 kgs.), Disposable load 563 lbs. (255 kgs.), Normal weight loaded 1,575 lbs. (714 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,750 lbs (793 kgs.), Wing loading 5.7 lbs./sq. ft. (27 kgs./sq. m.), Power loading 15.8 lbs./h.p. (7.2 kgs./h.p.).

Cirrus III—seaplane: Weight empty 1,118 lbs. (507 kgs.), Disposable load 525 lbs. (238 kgs.), Normal weight loaded 1,643 lbs. (745 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,643 lbs. (745 kgs.), Wing loading 6 lbs./sq. ft. (29.2 kgs./sq. m.), Power loading 18.2 lbs./h.p. (8.1 kgs./h.p.).

D.H. Gipsy—seaplane: Weight empty 1,116 lbs. (506 kgs.), Disposable load 525 lbs. (238 kgs.), Normal loaded weight 1,641 lbs. (744 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,750 lbs. (793 kgs.), Wing loading 6 lbs./sq. ft. (29.2 kgs./sq. m.), Power loading 18.2 lbs./h.p. (8.1 kgs./h.p.).

Cirrus-Hermes—seaplane: Weight empty 1,143 lbs. (518 kgs.), Disposable load 500 lbs. (227 kgs.), Normal weight loaded 1,643 lbs. (745 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,750 lbs. (793 kgs.), Wing loading 6 lbs./sq. ft. (29.2 kgs./sq. m.), Power loading 14.9 lbs./h.p. (6.3 kgs./h.p.).

Genet Major—seaplane: Weight empty 1,088 lbs. (493 kgs.), Disposable load 55 lbs. (252 kgs.), Normal weight loaded 1,643 lbs. (745 kgs.), Max. aerobatic weight 1,500 lbs. (680 kgs.), Max. permissible weight 1,750 lbs. (793 kgs.), Wing loading 6 lbs./sq. ft. (2.2 kgs./sq. m.), Power loading 16.2 lbs./h.p. (7.3 kgs./h.p.).

PERFORMANCE.—*Cirrus III.—land machine*: Max. speed at sea level 100 m.p.h. (161 km./hr.), Crusing speed 85 m.p.h. (135 km./hr.), Landing speed 44 m.p.h. (71 km./hr.), Initial rate of climb 700 ft./min. (213 m./min.), Range 480 miles (772 km.).

D.H. Gipsy—land machine: Max. speed at sea level 103 m.p.h. (165 km./hr.), Cruising speed 86 m.p.h. (137 km./hr.), Landing speed 44 m.p.h. (71 km./hr.), Initial rate of climb 720 ft./min. (219 m./min.), Range 470 miles (756 km.).

Cirrus-Hermes—land machine: Max. speed at sea level 112 m.p.h. (180 km./hr.), Cruising speed 94 m.p.h. (151 km./hr.), Landing speed 44 m.p.h. (71 km./hr.), Initial rate of climb 730 ft./min. (222 m./min.), Range 320 miles (514 km.).

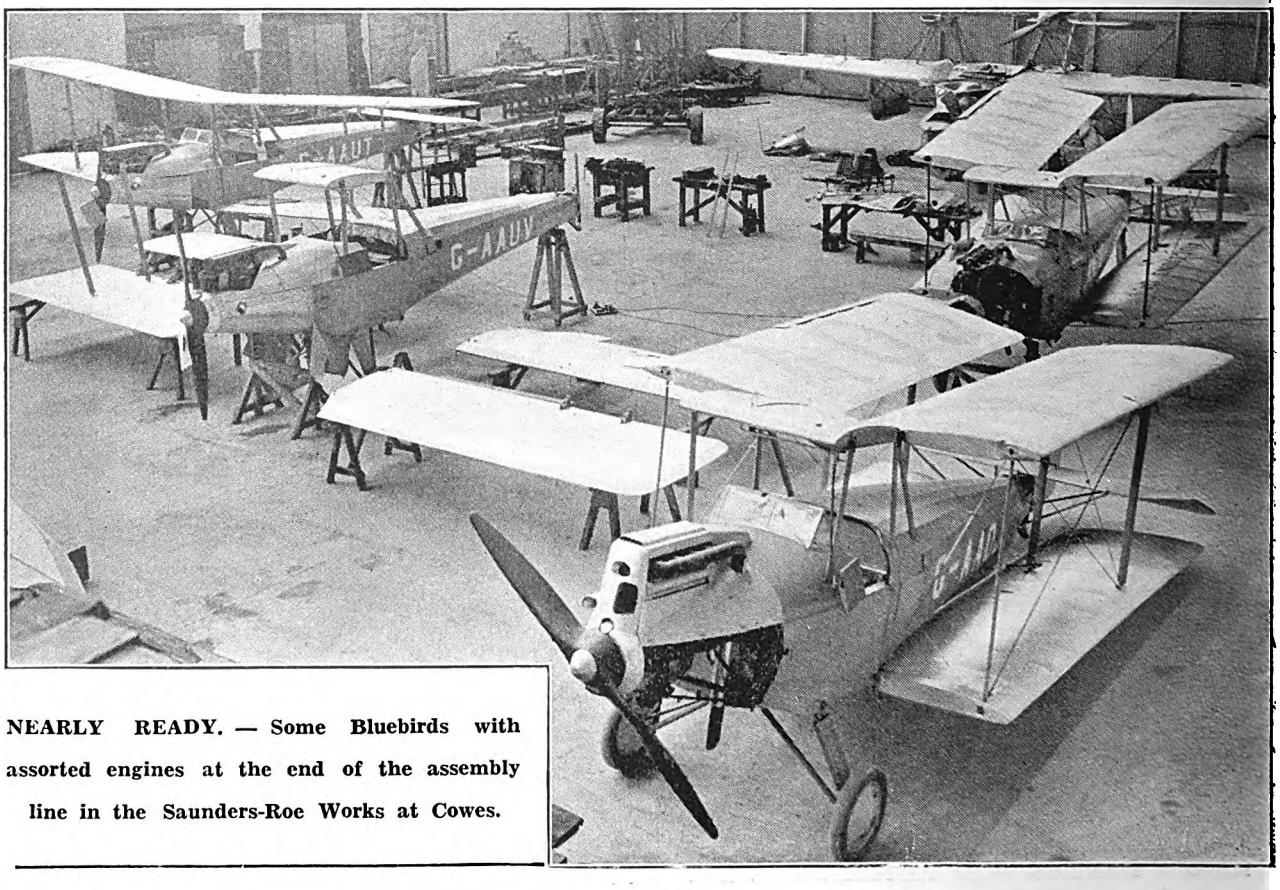
Genet Major—land machine: Max. speed at sea level 112 m.p.h. (180 km./hr.), Cruising speed 94 m.p.h. (151 km./hr.), Landing speed 44 m.p.h. (71 km./hr.), Initial rate of climb 730 ft./min. (222 m./min.), Range 320 miles (514 km.).

Cirrus III—seaplane: Max. speed at sea level 95 m.p.h. (152 km./hr.), Cruising speed 84 m.p.h. (135 km./hr.), Landing speed 44 m.p.h. (71 km./hr.), Initial rate of climb 600 ft./min. (182 m./min.).

D.H. Gipsy—seaplane: Max. speed 98 m.p.h. (157 km./hr.), Cruising speed 85 m.p.h. (137 km./hr.), Landing speed 44 m.p.h. (71 km./hr.), Initial rate of climb 650 ft./min. (198 m./min.).

Cirrus-Hermes—seaplane: Max. speed at sea level 108 m.p.h. (173 km./hr.), Cruising speed 93 m.p.h. (149 km./hr.), Landing speed 45 m.p.h. (72 km./hr.), Initial rate of climb 700 ft./min. (213 m./min.).

Genet Major—seaplane: Max. speed at sea level 108 m.p.h. (173 km./hr.), Cruising speed 93 m.p.h. (149 km.hr.), Landing speed 45 m.p.h. (72 km./hr.), Initial rate of climb 700 ft./min. (213 m./min.).



NEARLY READY. — Some Bluebirds with assorted engines at the end of the assembly line in the Saunders-Roe Works at Cowes.

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HOW ALL-METAL BLUEBIRDS ARE MADE.

Quantity-production is particularly applicable to aircraft which have metal structures, and the Blackburn Bluebird was designed to possess those qualities of simplicity and uniformity which make quantity-production possible. Such features as the simple method of building up the spars from two identical sections with a single line of rivetting, the use of a section for the fairing longitudinals which only needs one further operation to become suitable for the booms of the ribs, the straight lines of the structure of the fuselage, and the neat method of anchoring the bracing-wires of the fuselage were all evolved with this object in view.

The Bluebird is made in the works of Saunders-Roe Ltd., of Cowes. This firm is the result of a combination between two pioneering interests. Mr. S. E. Saunders founded S. E. Saunders Ltd., and became famous as a builder of racing boats. He built the first hull for a flying-boat in this country, and as long ago as 1912 he built the hull for the first successful amphibian for the Sopwith Aviation Co. Ltd. Mr. A. V. Roe, now Sir Alliott, designed, built and flew the first British aeroplane. Mr. Roe and Mr. John Lord, of A. V. Roe and Co. Ltd., joined Mr. Saunders in 1928, and Saunders-Roe Ltd. is the result.

The various works and enterprises of Saunders-Roe are grouped round the River Medina, which flows into the sea at Cowes and makes a sheltered anchorage.

The Folly Works, where ply-wood is made, are up-stream a little way from the town. Here logs of Gaboon mahogany, birch or other wood are taken from the river and for a long time are boiled in hot water to soften them. Then they are peeled on a form of lathe, which has a big cutter parallel to the axis of the log. This machine will flay off sheets of wood only .028 in. thick. When these sheets have been dried, shaped and prepared they are pressed together in the largest press of its kind in the country. It can produce sheets of ply-wood 50 ft. by 8 ft. if required.

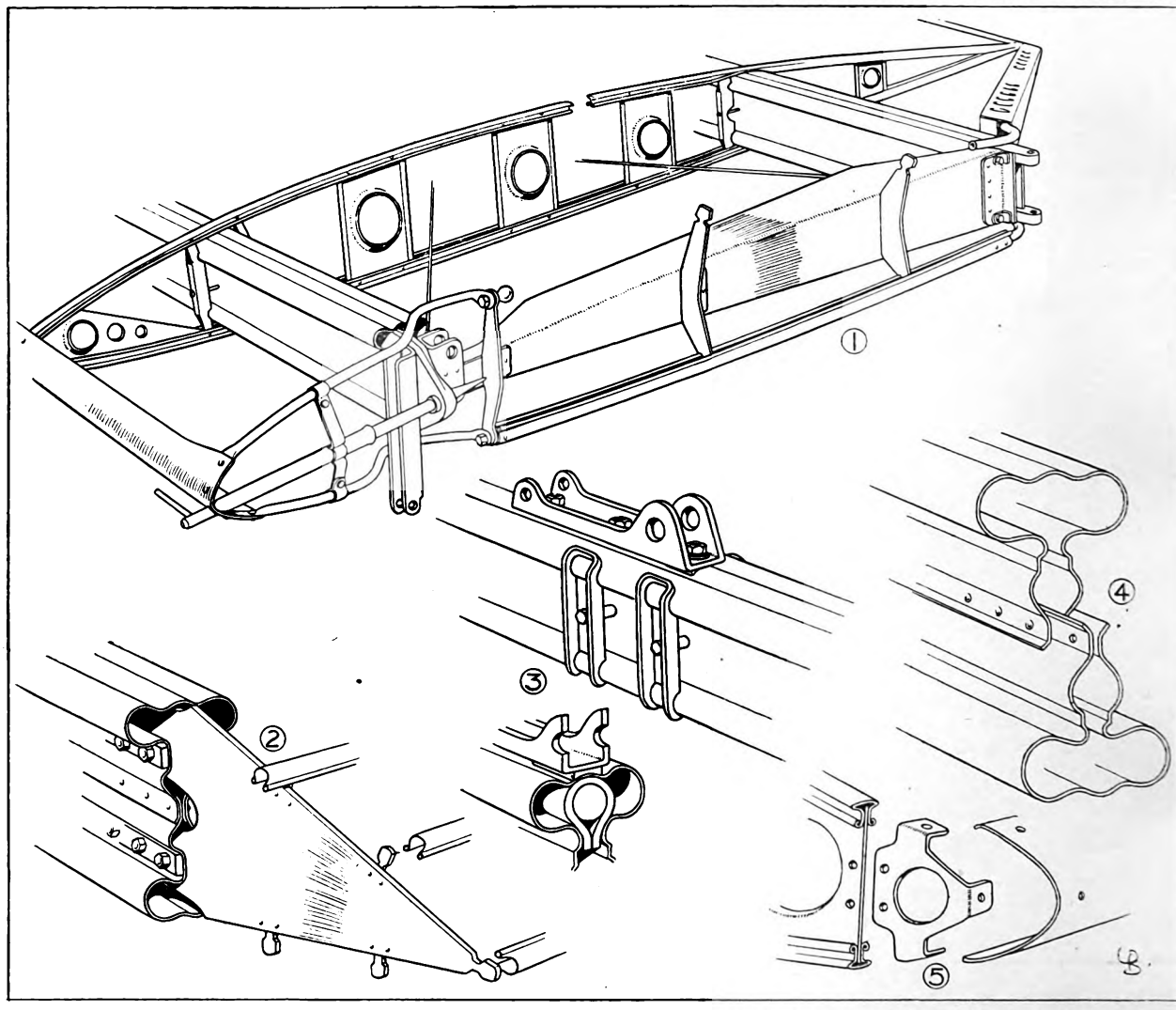
All the wooden wings for the various breeds of Saunders-Roe aircraft are built in the Folly Works, as are all wooden aircraft structures. This does away with the unnecessary transport of ply-wood from one shop to another. When these wings or other structures are ready they are floated down the river to the Solent Works, where the machines are erected and completed.

The company also have a complete ship-yard, which is a self-contained unit complete in itself with wood- and metal-working shops, erecting-sheds and slip-ways. They also have a service department or marine garage for power-driven boats. But of all the buildings the one which the visitor will remember longest is that which houses the offices and show-rooms which are built beside the river, opposite the Solent Works, with lawns and gardens in front.

The uninitiated might wonder at the somewhat scattered arrangement of these various shops. This scattering is the result of the long history of the company, who are celebrating their jubilee this year. As their work expanded they had to take over one shed here and another there until their premises reached their present proportions. Since the amalgamation Mr. John Lord has been organising and re-arranging until he has obtained the most economical lay-out for production and the minimum of inter-shop transport.

STARTING IN LIFE.

The Bluebirds start life in the Maresfield Works, which were originally divided into two parts by a road, this has now been roofed over and given a floor, so that a third bay has been added to the previous two. This increased accommodation has made possible the placing of the inspection department, the tool stores, the electro-plating and anodic-treatment departments between the machine-shop and fitters' shop and the unit-assembly shop. Thus all the detail parts for the Bluebird can be made under one roof and all



WING DETAILS.—(1) Wing root of upper starboard wing with top cap-strip removed; a standard rib is also shown. (2) The flat plate fitting which is inserted into the end of the spar to carry the wing-tip profiles. (3) The interplane strut and wire-bracing fitting with, below, a section of the top portion of the spar to show the internal reinforcement to carry this fitting. (4) A section of the spar which consists of two identical sections slid upon one another and rivetted along the centre-line. (5) The method of attachment of the leading edge.

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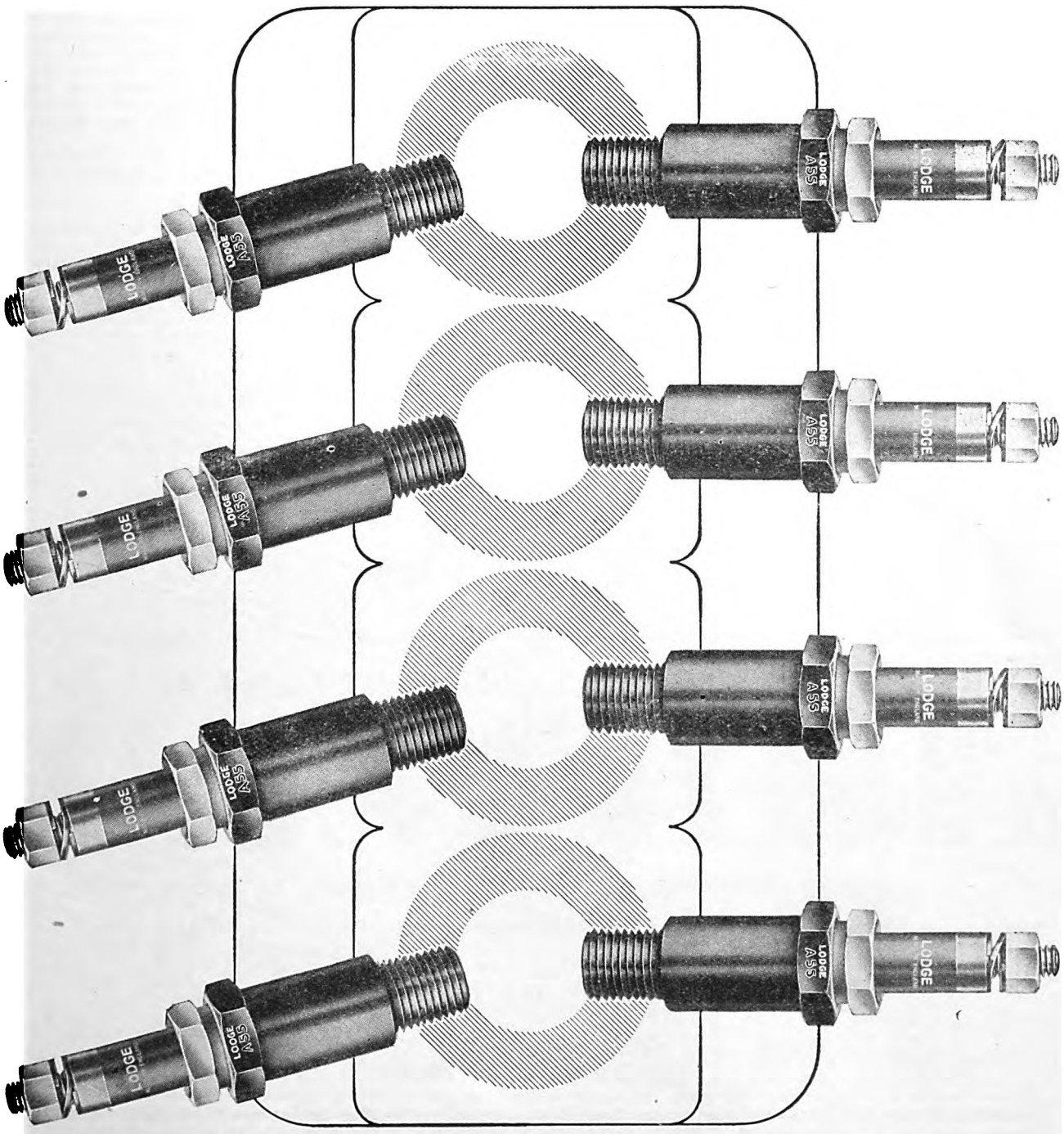

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February	MONTREAL—MEXICO CITY—MONTREAL	Flight Lieut. Forbes and Capt. Lumsden—Curtiss Reid Rambler
March	INDIA TO ENGLAND - - -	Mr.R.N.Chawla-Moth
April	8,000 MILES ROUND AUSTRALIA	Mr. Bardsley—Moth Mr. Annabel—Moth Mr. Wedgwood—Moth
May	ENGLAND TO INDIA - - -	Mr. M. Singh—Moth
May	ENGLAND TO INDIA - - -	Mr.A.Engineer—Moth
May	INDIA TO ENGLAND - - -	Mr.G.R.D.Tata-Moth
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part can be unbolted from the structure and a new unit put in its place.

The engine-mounting is the simplest form of structure and is assembled to a jig. Two duralumin channels are used to support the four light alloy castings which are bolted to the crank-case of the engine. These channels are bent up from heavy gauge sheet and are supported at either end by steel tubes, which have only to be cut to length and attached with flat plates and bolts to the channels. The flat plates are fixed with hollow rivets to the tubes. Each pair of tubes at each side meet at a fitting on the lower longeron.

The inner ends of the channels are attached to the apices of a "W," also made of steel tubes whose outer legs are fixed to fittings at the top longerons and the inner apex to a fitting on the cross tube in front of the fireproof bulkhead. This forms part of the engine-mounting structure and is carried by four steel tubes, the top one of which carries the centre fitting as explained above.

The main or centre portion of the fuselage is more complicated. It is a mixed structure of duralumin and steel tube.

The stresses from the wings are taken by two box-girders. These are made with flanges of channel section and webs of duralumin sheet which have flanged lightening-holes. The front girder has an extension upwards which carries the dash and the decking. The two cross-members are joined by similar boxes through which the longerons and diagonal side-bracing tubes run. Behind the seats there is a complete bay of the fuselage, which is rigidly braced. Each longeron ends in an eye which fits a fork-joint on each longeron of the rear portion.

This is probably the place to remark that all the tubing which is used for the fuselage is of the same diameter and gauge, which saves a considerable amount of trouble.

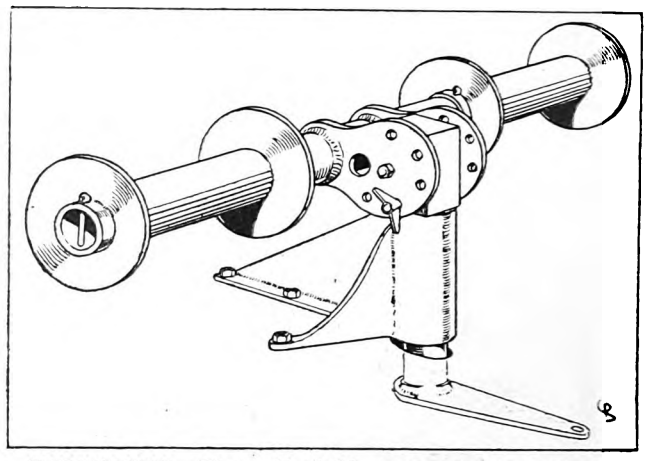
The after-portion is most attractive from the standpoint of quantity-production, as all the lines are straight and everything is square. First the longerons are cut to length and so are the cross-pieces and struts,—these are all of the same gauge and diameter. Then the fittings are put on the longerons.

These fittings are of the simplest. Two stampings of flat plate, which are used for every joint. This is made possible by off-setting the vertical and horizontal struts. The plates are fixed in place with hollow rivets.

When this has been done, the next step is to make up the sides. The longerons are laid in jigs and the struts put in. Then the swaged rods are screwed into the trunnions which, as already explained above, are pieces of steel bar which have a threaded hole athwart their major axis. The trunnions are carried in the plate fittings. In a very similar way two sides are put together, and thus the fuselage after-part is complete. This job is done by boys.

An end portion is attached to this after-part. It contains the tail-adjusting gear and the stern-post to which the rudder is attached, and this also houses the spring for the tail-skid.

The three main portions are then put together and trued up. When this has been done the undercarriage is attached and the tail-skid is put on. The fuselage now takes its place in the assembly-line.



SIMPLICITY.—The adjustable and easily removable rudder bar on the Bluebird.

FINAL PROCESSES.

The controls and instruments are next put in. The fuselage-fairing is also assembled. This fairing is interesting from a production standpoint. Diaphragms, channels curved to shape, or channel-pieces clipped to the main structure with U-bolts, are used to carry the spigots over which the longitudinals are sprung. These longitudinals are made from a drawn section which is used elsewhere in the machine and, with one modification, is used for the ribs.

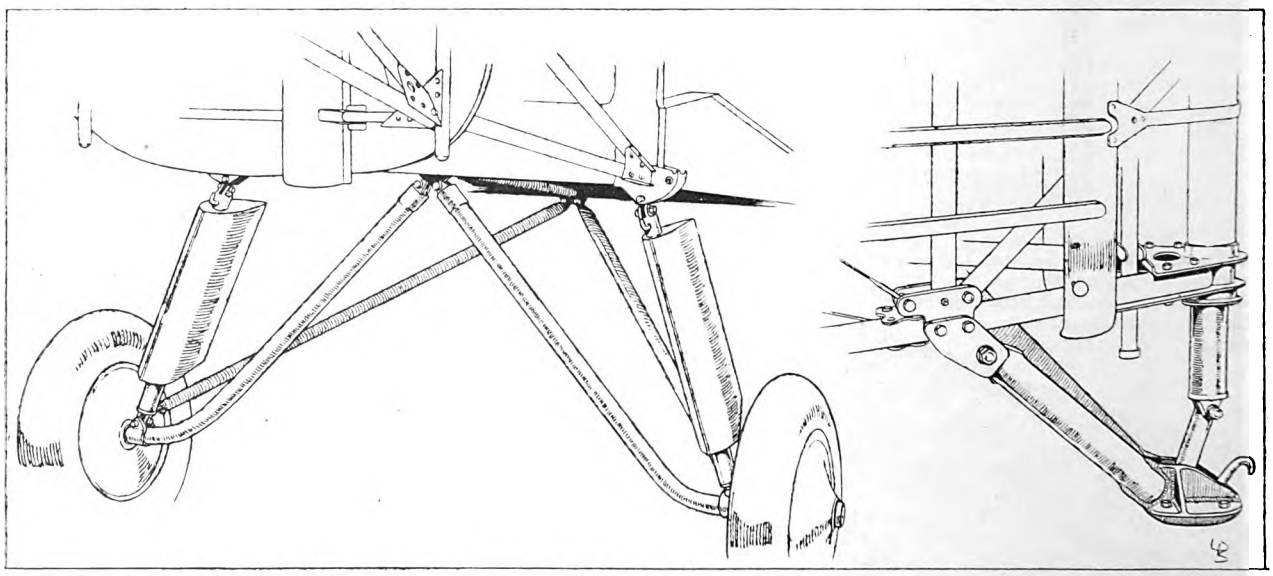
From the finished parts store an overhead rail runs to the end of the assembly line. From this rail depends a block and tackle so that when an engine is required this can be hoisted up in the stores and run out along the rail. It is then lowered on the machine, which is ready beneath the rail to receive it. After this, the cowlings are fixed in place and the exhaust system is completed.

The Bluebird uses the engine-maker's form of engine-cowling and exhaust system, but modifies the latter so that the pipe passes down the front of the fireproof bulkhead and out beneath the fuselage.

A particularly attractive feature of the Bluebird is the car-like interior of the cockpit, which has a floor which hides all the works. Through it only the two control columns, the tail incidence gear and the rudder-bars project. These are so arranged that no draughts can come through the floor. The windscreen and the seat and the interior upholstery are now put into place.

The fuselage is then wheeled away to the dope shop for covering and doping. When it comes out the wings are put on, and the other flying surfaces are fixed in position. The rigging is done and the controls connected up.

After the final inspection, the completed machines are towed up to the aerodrome behind and above the town and are put through their acceptance tests. When these have been passed the machines are flown away to their destinations or packed for shipment.—T. J.



LANDING GEAR.—On the left the divided type of undercarriage and on the right the tail-skid. As may be seen, the spring of the tail-skid is inside the rudder-post. In the undercarriage the radius-rods are along the centre-line of the fuselage, with the weight-carrying spring-members attached to the stubs which carry the wings.

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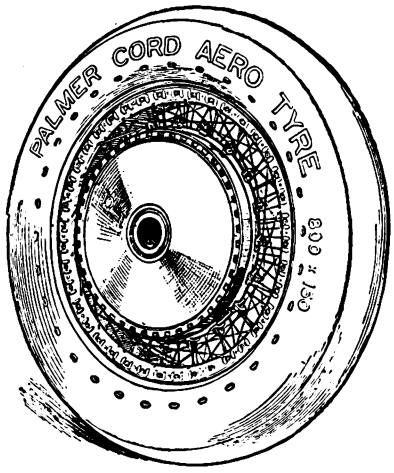
For safety and efficiency fit PALMER

Aircraft Wheels,



Tyres & Brakes

Palmer landing equipment is employed by the manufacturers of

THE BLACKBURN BLUEBIRD

and by many aeroplane constructors of repute throughout the World.

PALMER WHEELS, TYRES AND BRAKES for AIRCRAFT are the lightest, strongest and most suitable in design for every type of machine. Palmer Aircraft Brakes are easy to install, easy to operate, easy to maintain in perfect order. Every flying man should obtain a copy of The Palmer Brake Book in which this latest Palmer invention is fully described and illustrated.

THE PALMER TYRE LIMITED,

Contractors to the Admiralty, War Office and the Air Ministry,

100-106, CANNON STREET, LONDON, E.C.4.

(652)

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HOW BLUEBIRDS ARE SOLD.

The motor trade has proved that a factory's job is not to distribute but to manufacture. Distribution is a specialised business, a trade of its own, and as such is recognised by the man in the street, who does not expect to buy gramophone records or groceries from the factories but from the excellent Mr. Keith Prowse or Mr. Fortnum and Mr. Mason.

Selling is made easier if a prospective buyer can see under one roof or in one shop a number of products all more or less similar to the type he intends to buy. He is able to compare them and satisfy himself which he really prefers. If he visits the showrooms of a manufacturer he will probably feel that before making his decision he ought to go and look at the products of a competitor.

If Aviation is to become part of our daily lives to the extent that motoring has,—and everyone who reads THE AEROPLANE believes that it will,—the people who will buy aeroplanes are the people outside Aviation who know little or nothing about the world of aircraft. These people are they who have expensive cars, expensive motor-boats and expensive holidays—the sort of people who have money to spend on new forms of transport which are entertaining or offer a means of saving time.

The wealthy New Yorker who lives some considerable way up the Hudson in the morning crawls aboard his ultra-rapid motor-boat in a dressing-gown. On his way to the office at some fantastic speed he will breakfast, shave and dress. Such people will become interested in aircraft immediately they find that the firms from whom they buy their cars are selling aircraft and giving the service which they have become accustomed to accept as part of what is sold with the car. They will realise that flying is a practical proposition and merely a matter of money. They will buy machines and learn to fly themselves.

The time when people learned to ride bicycles is past. Once, wobbling machines could be seen everywhere with an attendant panting behind and bellowing instructions. You never see it now. Children seem to be born "scooter-minded" and can cycle immediately they are old enough to graduate from small diameter wheels to larger ones. Before the War learning to drive a car was a recognised preliminary, now nobody really bothers much about it.

Perhaps the time is not so far distant when learning to fly will become an unnoticed part of one's normal experience. One learns to do so much without realising it, if one's friends are proficient or one's relatives are expert.

The big motor distributing firms are coming into the aircraft business, and one of the first to do so was Auto-Auctions Ltd., who are the sole distributors for the Blackburn Bluebird all over the World. This firm have a maxim that every transaction to be complete must end to the satisfaction of the customer. To the spirit which underlies such a maxim can probably be attributed the success of this widely-known distributing organisation for motor-cars, which was founded in 1919 and has behind it thirty years' experience of the engineering and motor industry. Auto-Auctions Ltd. have pioneered many of the schemes which are to-day as done in the motor trade, the guaranteed re-purchase system for colonial or foreign visitors may be quoted as an example.

The head offices of Auto-Auctions Ltd. are in Horseferry Road, S.W.1, where they have a Service Station and auction rooms. Here are always a large number of used cars in first-class condition which have been accepted in part-exchange. At their establishment in Burlington Gardens, the opening of which was reported in THE AEROPLANE in June 1929, they keep a representative selection of new cars by leading makers.

The firm are always pleased to give expert advice and to quote for the building of special bodies on any particular chassis and incorporating therein the customer's own ideas.

The ideas of Service held by Auto-Auctions Ltd. are pretty comprehensive and include making all the necessary arrangements for insurance, for licences, for R.A.C. and A.A. membership, for service after purchase and for purchase out of income. They also give every assistance to those who wish to travel in their cars abroad. The firm have also developed a scheme whereby Auto-Auctions Ltd. contract for the annual replacement of a car and at the same time quote a minimum allowance for the car on its return. And these same ideas are being applied in their Aviation Department.

The firm are particularly careful to preserve the personal touch. The services of one of the directors are always available at any of their depots.

The Aviation Department is at Burlington Gardens and in charge of Sq. Ldr. C. A. Ridley, D.S.O., M.C., who is one of the directors. One ventures to abstract the following note about Sq. Ldr. Ridley from "Flying Fury" (by James McCudden, V.C., D.S.O., M.C., M.M.), recently published:—

Mr. C. A. Ridley, while serving with No. 60 Squadron, had a forced landing with engine trouble near Cambrai, in August 1916, when he was endeavouring to land a French agent behind the enemy lines. They were uninjured and they moved about the enemy country for two weeks picking up military information. They crossed into Belgium, and Mr. Ridley, who spoke neither French nor German, assumed the disguise of a deaf and dumb peasant. He was arrested

ON DISPLAY.—The Bluebird—and a spare Hermes engine—in the show window of Auto-Auctions Ltd. The Hermes engine has a Heywood compressed-air starter fitted, a convenience for the private owner.

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"TITANINE" DOPE

AND

THE BLACKBURN "BLUEBIRD"

The above is a photo of the Bluebird in which Sqd. Leader Slatter flew from London to Cape Town.

THE BLACKBURN AEROPLANE AND MOTOR COY. LTD. WRITE AS FOLLOWS:

Dear Sirs, 10th May, 1930.

We have pleasure in stating that your Dopes were used on "Bluebird" machine flown by Sqd. Leader Slatter from London to Capetown. Also they have been used for several years on our various products and have given entire satisfaction.

TITANINE - EMAILLITE LTD.,

175, PICCADILLY,
LONDON, W.1.

Factories
Hendon (London, N.W.9).
New York (U.S.A.).
Milan (Italy).
Bremen (Germany)

Telephones:—
Gerrard 2312.
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FLY AS YOU DRI

Here then is the side-by-side cockpit at last! Perfectly comfortable! Perfectly roomy! Perfectly companionable! And built into a fuselage of all-metal construction which is still perfectly stream-lined. This is a triumph in aircraft designing. A triumph for the Blackburn Aircraft Company who build seater 'plane. A of over twenty y A 'plane which performance, an comfort. Comfo depends on scru

BLACKBUR

SOLE WORLD DIST

AUTO-AUCTIONS LIMITED, Burlington Gardens, *opposite Burlington Arcade*, Bond Stre

KINDLY MENTION "THE AEROPLANE" WHE

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THE SARO "CUTTY SARK"

("AEROPLANE" Photo.)

FLYING-BOAT OR SALOON AMPHIBIAN

THE "Cutty Sark" is the ideal "light flying boat." Large enough to be seaworthy, yet small enough to be handy, she possesses all the characteristic advantages of the flying boat, coupled with a new ease of maintenance and low first cost. For training purposes, for patrol work, or for the private owner she possesses points of appeal.

Powered with two light aero engines, she cruises at 90 m.p.h. and seats four in a silent and vibrationless cabin. Her absence of wire bracing indicates that maintenance has been reduced to a minimum. Provision has been made for easy handling on the slipway and when taxying.

A Saro "Cutty Sark" amphibian undercarriage can be fitted which makes her as easy to handle on land as on the water.

SAUNDERS-ROE ALSO CONSTRUCT THE BLACKBURN "BLUEBIRDS."

SAUNDERS-ROE, LTD.

BUSH HOUSE, LONDON, W.C.2, and COWES, ISLE of WIGHT.

CONTRACTORS TO THE AIR MINISTRY, ADMIRALTY, WAR OFFICE, CROWN AGENTS. R.N.L.I., etc.

Constructors of all types of aircraft; of lifeboats, yachts, and all marine auxiliaries. Manufacturers of plywoods, and metal plys.

Aeromarine

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When the oil is run into the cylinder head to the level of the upper spark-plug hole the burette reading gives the capacity of the head under test. An error of two cubic centimetres either way is permitted in any head.

The crank-shaft is a satisfactory and solid-looking job. It comes from the machines turned to size for main and big-end bearings, balanced and drilled for oil. Among the things which are done to it before it arrives at the sub-assembled state is the insertion of plugs and the lapping in of baffles to keep the oil flowing in right and proper channels. The thrust-block is installed on one end (this is a deep-groove journal-type bearing though it takes no journal loads), and at the other end the driving pinion for the cam and other gears is screwed on. The airscrew hub is lapped onto the tapered shaft, first with abrasive and then with metal polish to ensure a perfect fit.

Fitting the connecting-rods is the next process. They are installed on the crank-shaft and tested for alignment in all directions on a plane table with accurate instruments (of American manufacture). The big-ends are reamed to fit and the end-clearances made with a hand-tool. The rods are numbered for their individual bearings and taken off again until a later stage in the process.

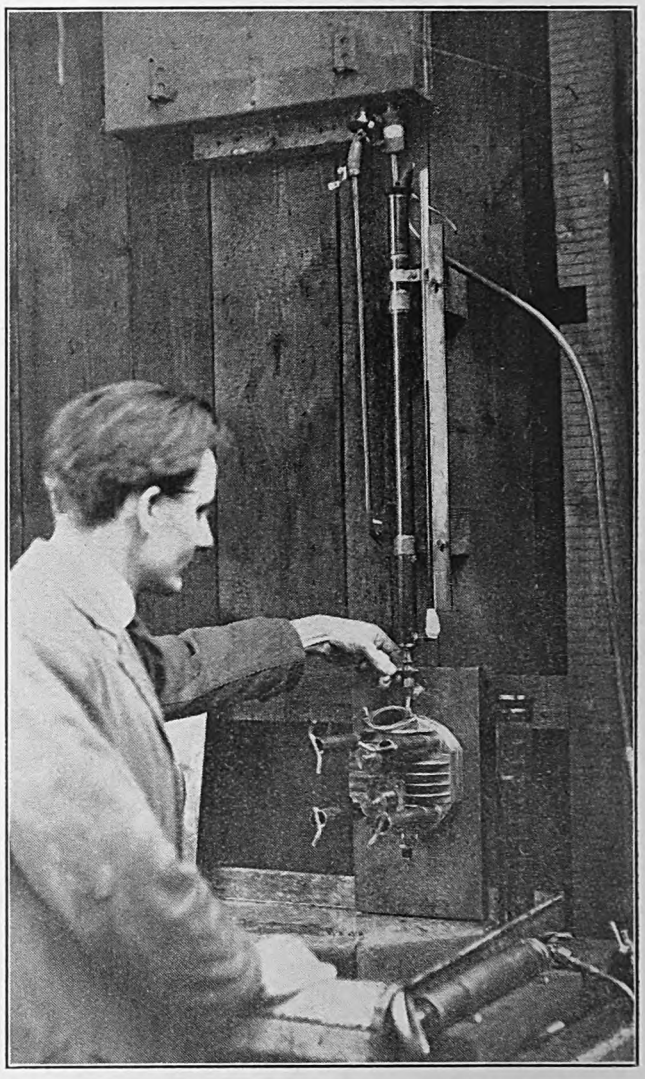
Unlike the connecting-rods of the earlier Cirrus engines, those of the Hermes are of steel, machined all over. These require more careful balancing than those of the lighter aluminium alloy, and again the technical staff has risen to the occasion and devised a twin differential scale. The tester slips cylindrical steel blocks into the big-end and gudgeon-pin holes. These blocks have knife-edges protruding centrally from the ends to rest on the balance hooks. One gramme is all the tolerance allowed at each end.

The cam-shaft needs but little sub-assembly, only a hardened button for end-play adjustment. The shaft itself is light, but the cams are situated close to the bearings to minimise bending stresses, and the bearings themselves are ample both in diameter and in width. They are made to fit in bearings of a size to admit insertion of the whole cam-shaft from one end, and the bearing surfaces are spirally grooved for oil.

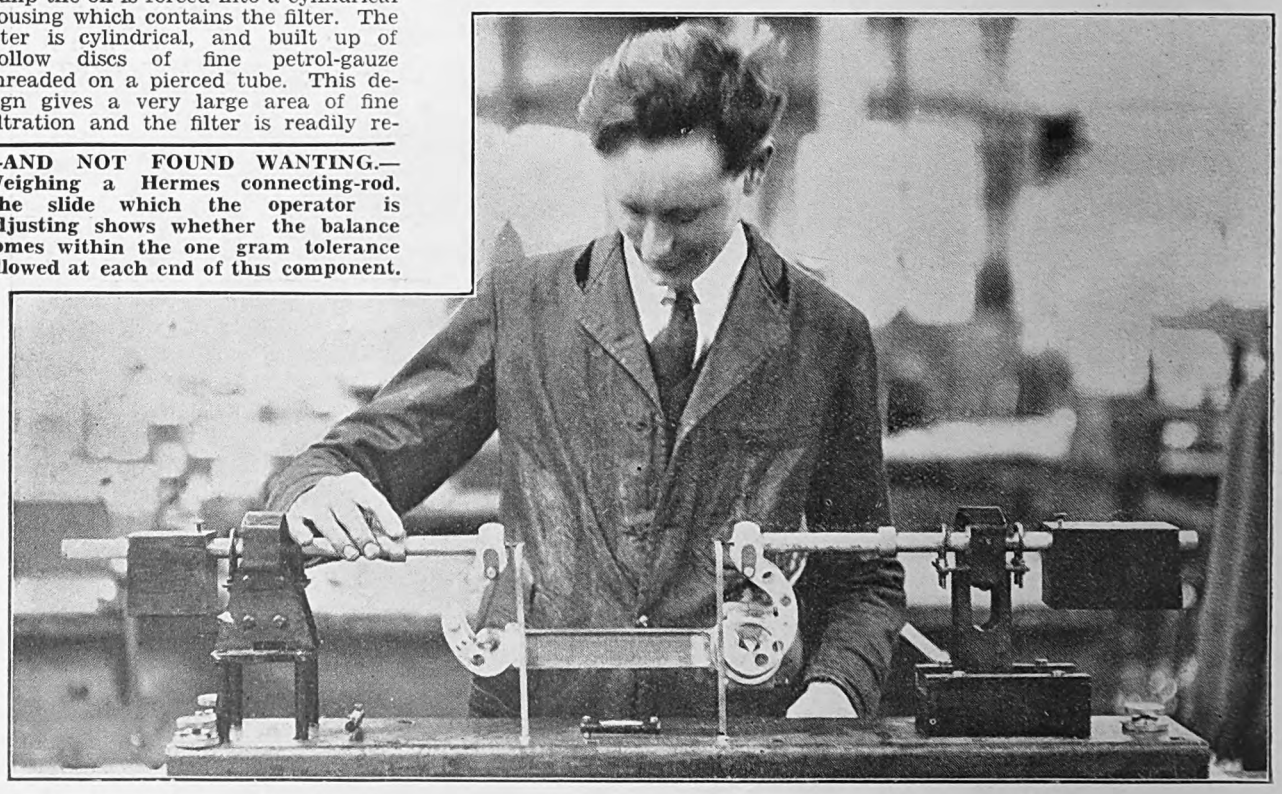
The top half of the crank-case differs from the earlier Cirrus mainly in the symmetrical and clean design of the rear casing for auxiliary gears, magneto housings, etc. The cylinder-barrels are secured in the usual way by studs passing from the crank-case to the cylinder-heads, but in the Hermes the cooling-fins of the cylinder are bored, not interrupted, to accommodate them.

This component also carries the five main bearings, which are of plain journal type, slightly wider for the ends and middle than for the intermediate ones. The cam-shaft bearings are quite plain with bronze liners drawn in.

The installation of the crank-shaft is followed by the first portions of the oiling system. The oil system in the Hermes is the outcome of considerable care and thought by Mr. Caple. From a submerged pump in the lowest part of the sump the oil is forced into a cylindrical housing which contains the filter. The filter is cylindrical, and built up of hollow discs of fine petrol-gauze threaded on a pierced tube. This design gives a very large area of fine filtration and the filter is readily re-



THE PHRENOLOGIST.—An assembled cylinder-head for a Hermes engine clamped to the steel face-plate to have its cranial capacity tested. The apparatus was devised and made up by the Cirrus technical staff.



—AND NOT FOUND WANTING.—Weighing a Hermes connecting-rod. The slide which the operator is adjusting shows whether the balance comes within the one gram tolerance allowed at each end of this component.

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Every BLACKBURN BLUEBIRD

carries one of these plates

BAP

GIPSY BLUEBIRD

MAX RPM 2100
NORMAL RPM 1900

	LANDPLANE	SEAPLANE
TOP SPEED	108 MPH	102 MPH
CRUISING	85 "	82 "
CLIMBING	60 "	58 "
STALLING	42 "	44 "

LUBRICATE ONLY WITH MOBILOIL.
BUILT BY SAUNDERS-ROE LTD COWES, I.O.W.

BAP

CIRRUS III BLUEBIRD

MAX RPM 2100
NORMAL RPM 1900

	LANDPLANE	SEAPLANE
TOP SPEED	105 MPH	100 MPH
CRUISING	85 "	85 "
CLIMBING	60 "	60 "
STALLING	42 "	44 "

LUBRICATE ONLY WITH MOBILOIL.
BUILT BY SAUNDERS-ROE LTD COWES, I.O.W.

"Lubricate only with Mobiloil" — and this recommendation is endorsed by the letter which follows:—

THE BLACKBURN AEROPLANE & MOTOR CO., LTD.,
BROUGH, EAST YORKS.
13th May, 1930.

The Vacuum Oil Co., Ltd.,
Caxton House, Westminster, London, S.W.1.

Dear Sirs,

It gives us much pleasure to inform you that as a result of our long experience of your products, we are absolutely satisfied with the efficiency of your Mobiloil for the lubrication of the machines which we produce.

We have used Mobiloil for a great many years, and our customers cannot do better than employ it in their machines.

Yours faithfully,
(Signed) S. HUDSON, Director.

So is recognised the irreproachable quality of Mobiloil — further confirmed by the recommendation of other leading manufacturers, including the makers of the Bristol, Genet, Hermes, Jaguar, Leopard, Lynx, Mongoose and Salmson Aero Engines. This consensus of authoritative opinion is your sure guide to correct lubrication—insist on Mobiloil!

"Lubricate only with

Mobiloil"

REGD TRADE MARK.

for safety and reliability

VACUUM OIL COMPANY, LTD., CAXTON HOUSE, LONDON, S.W.1.

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moved from outside for inspection or cleaning. Foreign matter adheres to the outside of the gauze discs, whence it is easily cleaned.

The oil passes through the gauze into the core of the filter, and so out into the only external pipe in the whole system, which leads round to a union in the side of the sump and so into the main oil gallery. Instead of being outside, as it was in the earlier Cirrus models, the oil gallery runs centrally down the length of the crank-case underneath the crank-throws, and a lead from each main bearing cap takes the lubricant to the mains, through the crank-shaft to the big-ends, and the leakage through the bearing-clearances is enough to oil the cylinders by splash.

The arrangement of the cam and auxiliary gears is another feature of the Hermes. The only departure from straight gears is for the oil pump, which has a worm drive on ball-bearings for the vertical pump-shaft. This one exception was conceded in order to retain the advantages of a submerged oil-pump. The worm gear is mounted in a special housing which also carries the straight gear to drive it, and the unit can be removed without disturbing anything else.

The same is true of the magneto-drives, which are situated symmetrically on either side of the engine with the Watford magnetos pointing forward. The magneto mountings are definitely a neat feature, as they enable the mechanic to remove the magneto, drive-pinion and all from the front without even taking off the rear cover. The auxiliary housing which contains the combined vernier adjustment and flexible coupling, and the impulse starter, and mounts the drive-pinion on the magneto, can also be left in position so as not to disturb the gear, and the magneto can be removed at the coupling. Three bolts secure and align the complete installation.

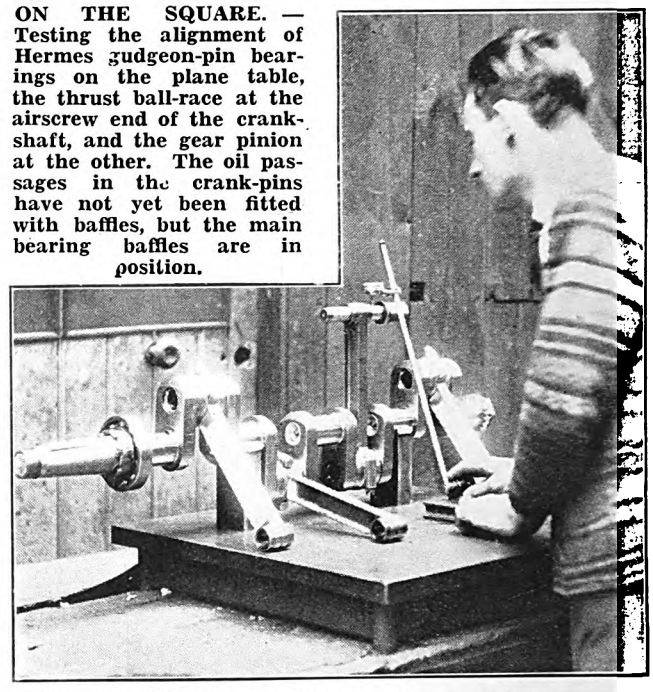
No auxiliary drive is carried by the rear gear-cover except the tachometer attachment, which can be screwed on either magneto pinion and is spring-driven so that it does not need accurate alignment.

The top section of the crank-case is assembled as far as possible before the connecting-rods are mounted with their pistons, and the cylinders and assembled cylinder-heads attached. The carburettor and manifold, ready assembled, is next installed, and then the sump put on.

The Hermes sump is characteristic in shape and the new type has cooling-fins on the under surface. An aerobatic tray is standard on production engines. This is merely an aluminium sheet tray secured over the sump and under the cranks to prevent the oil from flooding into the cylinders during inverted flying. A hole in the middle is covered with gauze. It replaces the gauze tray which was used in earlier Cirrus engines.

Controls for the Claudel Hobson carburettor and the magnetos are led back to a satisfactorily solid and simple transverse shaft mounted on the rear gear-case. The magneto advance works with the throttle opening until the latter is half-way, when the spark is fully advanced and remains so at all wider throttle openings.

As the power of four-in-line engines is stepped up the cooling problem becomes more urgent. To have cylinders sticking vaguely into the slip-stream is no longer enough, as it was when cylinders were smaller and delivered a mere 15 or 20 h.p. each.

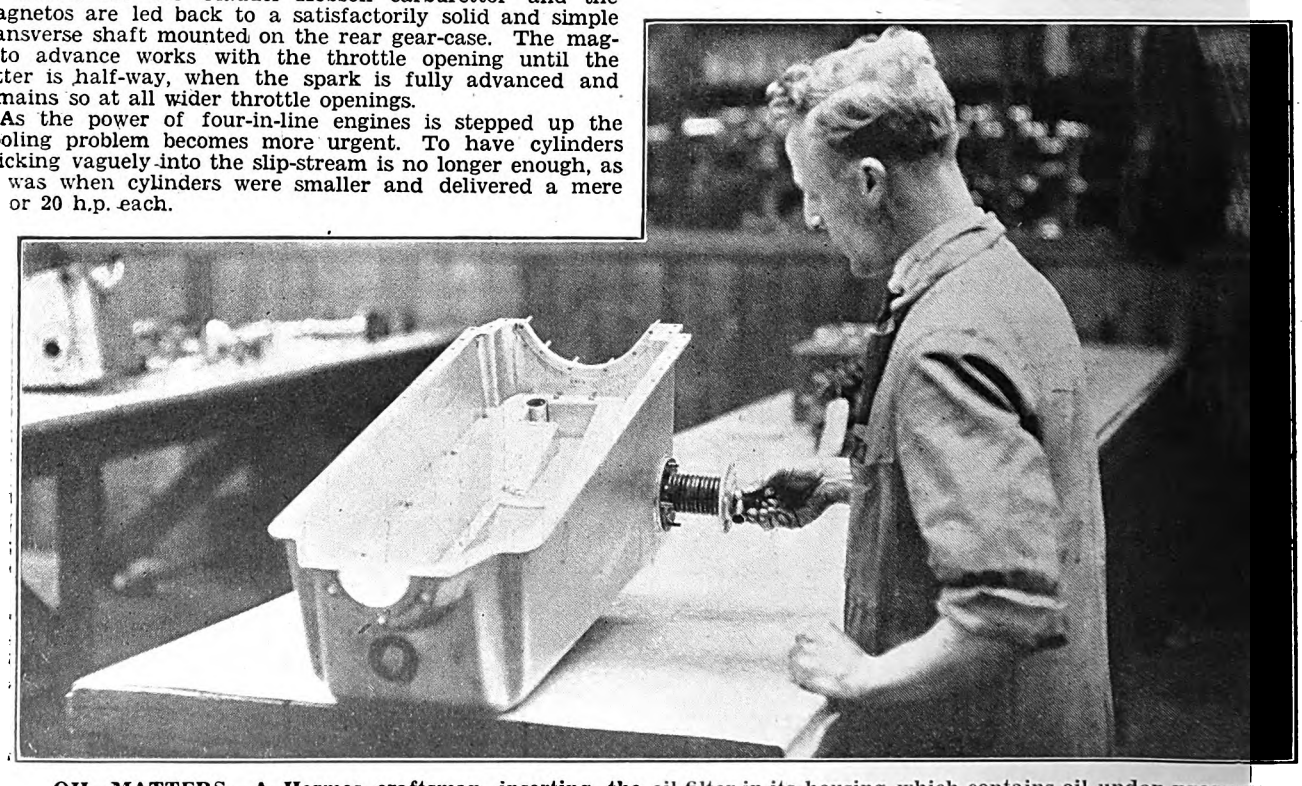


ON THE SQUARE. — Testing the alignment of Hermes gudgeon-pin bearings on the plane table, the thrust ball-race at the airscrew end of the crank-shaft, and the gear pinion at the other. The oil passes in the crank-pins have not yet been fitted with baffles, but the main bearing baffles are in position.

To cope with this situation the Cirrus designers provide an open type cowling with each engine. It consists merely of properly designed sheet-metal chutes to direct air round the sides and tops of the cylinders, and a nose-piece which helps the fairing without excluding necessary air. Certain machines can be supplied with complete cowling, but this depends directly upon the design of the aeroplane itself.

During the War 1914-18 the same system was used for stationary air-cooled engines, but modern cowlings are strikingly compact beside the ungainly scoops then used to capture as much of the relatively slow slipstream as possible. Certain types of light aircraft have their Hermes engine most beautifully cowled, and it is Mr. Caple's ambition to do as much for all the others.

The efforts of Messrs. Caple and Thorn to exhibit everything there was to see were ably seconded by Mr. Palmer, of the shops, who obligingly helped with the illustrations by inducing his blushing satellites to brave the camera and provide "human interest."—F. D. B.



OIL MATTERS.—A Hermes craftsman inserting the oil filter in its housing, which contains oil under pressure when the engine is running. The oil enters the core of the filter through the hollow gauze discs threaded on it, the meshes of which are finer than the screen of this picture. In the sump can be seen the aluminium aerobatic tray with a vertical tube for the oil-pump shaft in the far corner.

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HOW GIPSY ENGINES ARE MADE.

The Blackburn Bluebird is offered with four standard power units so that the purchaser has a choice of three makers, two types (radial or air-cooled), and four ranges of horse-power. One of these standard power units is the D.H. Gipsy Mark I.

Since 1927, when the D.H. Gipsy engine was first introduced, over 1,200 of them have been made. This is a remarkable achievement, if one considers that in this time the De Havilland Company have brought a new engine through its teething troubles, tooled up their works for it and produced it in quantities. The achievement is made more considerable by the fact that the company had no equipment for the job and had to lay out and equip the necessary shops. Even now the demand for increased production is making modifications and extensions to the shop necessary.

One aspect of the problem that the company had to face was the fact that the output was not large enough to warrant the use of the most specialised machinery,—for instance to use a multi-spindle drilling machine for the crank-cases was not economic and a compromise had had to be reached. The job is fully jigged, and to keep this equipment up to date and in line with the modifications that progress has shown to be necessary has kept the tool room working "overtime" for three years. It is a large tool room too.

The engine shop is a large building, with all its appertaining processes and stores part of it or immediately adjacent thereto. The stores, the view-room, the tool-room, which is in two sections, one for machines and the other for fitters, the heat-treatment department, and the laboratory are all arranged about its interior.

The system of inspection which has been developed is of special interest. The most essential feature of any inspection system is that it shall prevent any faulty component from reaching the assembly line. Equally important in practice is the keeping of any scrap down to a minimum. When material is being produced in quantity a faulty setting on the machine or a damaged jig will automatically produce a steady stream of scrap. Yet while preventing this the inspection system must not interfere with the normal flow of production.

The De Havilland Company have achieved this by having a number of inspectors out in the shop whose duty it is to inspect the first item of any one batch. They also inspect occasional samples. This automatically checks the setting of the machine and ensures that the batch will be up to standard. When the complete batch has been finished then the view-room inspects the lot. The exceptions to this are the larger jobs, such as crank-cases, which are inspected more or less *in situ* to avoid excessive handling.

If one wanders round the shop some of the more interesting operations catch the eye immediately. As the crank-cases come through from the approved stores they are placed in a jig and the face of the joint with the other half crank-case is rough-cut in one operation in a vertical-spindle milling machine. A cutter of large diameter is used which machines right across the width of the crank-case, so that the job has only to be fed along its length. Removing the crank-case from the jig after this operation allows the metal to settle, and so avoids any distortion that may have occurred during the rough-cut.

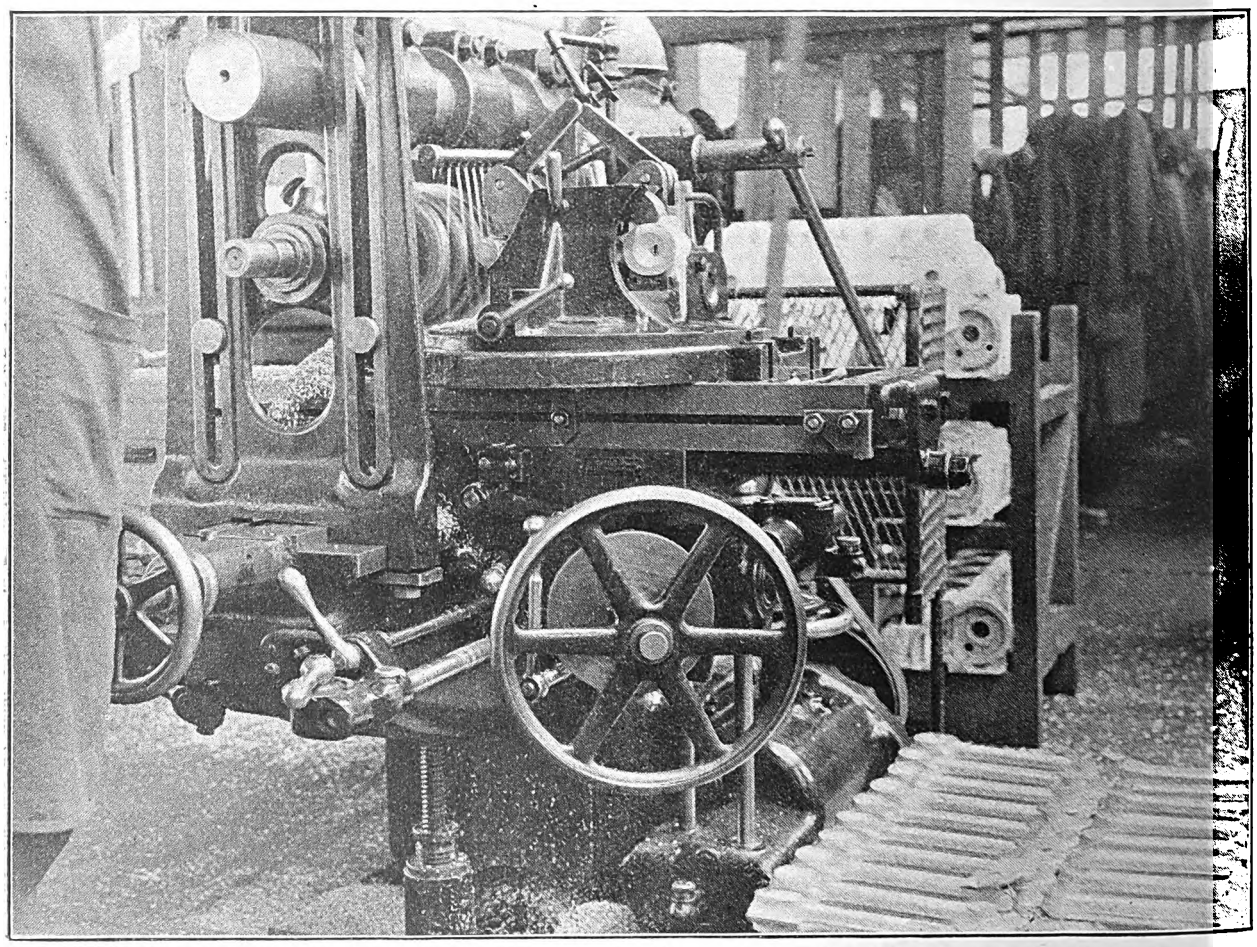
Various forms of gang-milling are extensively used in the shop. One of these is milling the faces of the main bearings of the crank-case. The upper part of this, with the bearing-caps bolted into position, is laid sideways in a horizontal-spindle machine. By moving the crank-case into the machine the faces of the bearings can all be cut at one time.

A similar scheme is employed for facing the big- and little-ends of the Y-alloy connecting-rods which are placed in a jig in pairs, the little-end of one opposite to the big-end of the other. Each pair of ends is then machined together in a standard milling machine with a gang of side-milling tools.

Another double operation is made on the connecting-rods on a special two-spindle drilling machine. This has been so arranged that while one big-end is being rough-bored the other big-end can be finish-bored at the same time. The same process is then applied to the little-ends.

A neat jig has been evolved to hold the cylinder-heads during machining of the faces of the ports, which are set at an angle to each other in the cylinder-head. This jig is so arranged that when one face has been machined with an end-mill the operator swings part of the jig through less than 90 degrees and the other port-face is then in position, and this without any re-setting of the machine.

An interesting operation is the finishing of the aluminium-alloy pistons which, instead of being ground, are finished with a diamond in a lathe. This gives an extremely satisfactory finish. The piston is held by a pin through the gudgeon-pin bearings, which at this stage are only rough-



TWO AT ONCE.—The big and little ends of the connecting-rods for the D.H. Gipsy engine being faced in pairs in one gang-milling operation.

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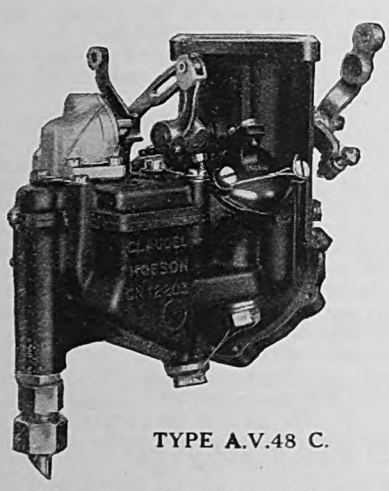
CLAUDEL HOBSON

AERO CARBURETTERS



TYPE A.V.48 C.

The power jet gives maximum power with economical cruising.

A.V. and A.H. 48 C and D Series are standard on the following famous light aeroplane engines :—

SCORPION HORNET	A.B.C. MOTORS LIMITED
GENET GENET MAJOR	ARMSTRONG SIDDELEY MOTORS LIMITED
GIPSY II GIPSY III	DE HAVILLAND AIRCRAFT CO. LTD.

H. M. HOBSON LTD.

47/55, THE VALE, ACTON, LONDON, W.3.

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Magnetos

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NOTABLE ACHIEVEMENTS

The Schneider Trophy Contest, 1929—1st Place.
The World's Air Speed Record—357.7 m.p.h.
1st and 2nd Places in every King's Cup Air Race.
1st and 2nd Places in every Aerial Derby.
First Non-Stop Flight to India.
World's Motor Boat Speed Championship.
German Motor Boat Speed Championship.
World's Speed Record for Cars.

These and many similar achievements demonstrate the ABSOLUTE RELIABILITY OF B.T.H. MAGNETOS.

The British Thomson-Houston Co., Ltd.,

Alma Street - - Coventry.

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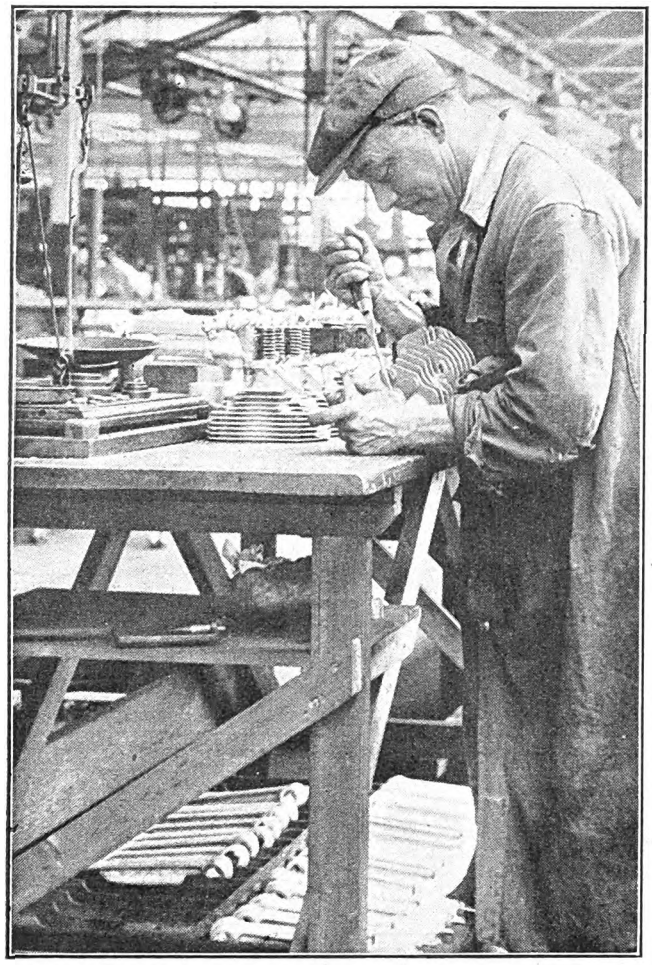


THE ASSEMBLY LINE.—An operation on the head of a D.H. Gipsy cylinder.

bored. This pin slips through a rod which runs through the face-plate to outside the headstock and can be tightened. Thus the piston can be pulled against a locating jig on the face-plate, which locates from a bored surface on the interior of the skirt. The faces of the gudgeon-pin bearings after boring are faced by being gang-milled in one operation. Naturally, small diameter cutters have to be used, as there is not much clearance available.

When the machining operations have been completed the pieces are put together along the side of the shop devoted to assembly. Here the sub-assemblies go together on benches and the crank-case assembly is started on special handling trolleys. When the engines have been completely assembled they are run-in for two hours by an electric motor. When this has been done and all the openings have been carefully masked to prevent the entry of dust the completed engines are taken off to the test shop.

Here there is so much noise that you only notice the vibration and do not realise the din until you try to speak. The staff perforce become expert lip-readers. The engines are put on benches in an open-sided shed and fitted with wind-brakes,—a clumsy-looking relative of the airscrew, designed to absorb the engine power, and called in America a club.

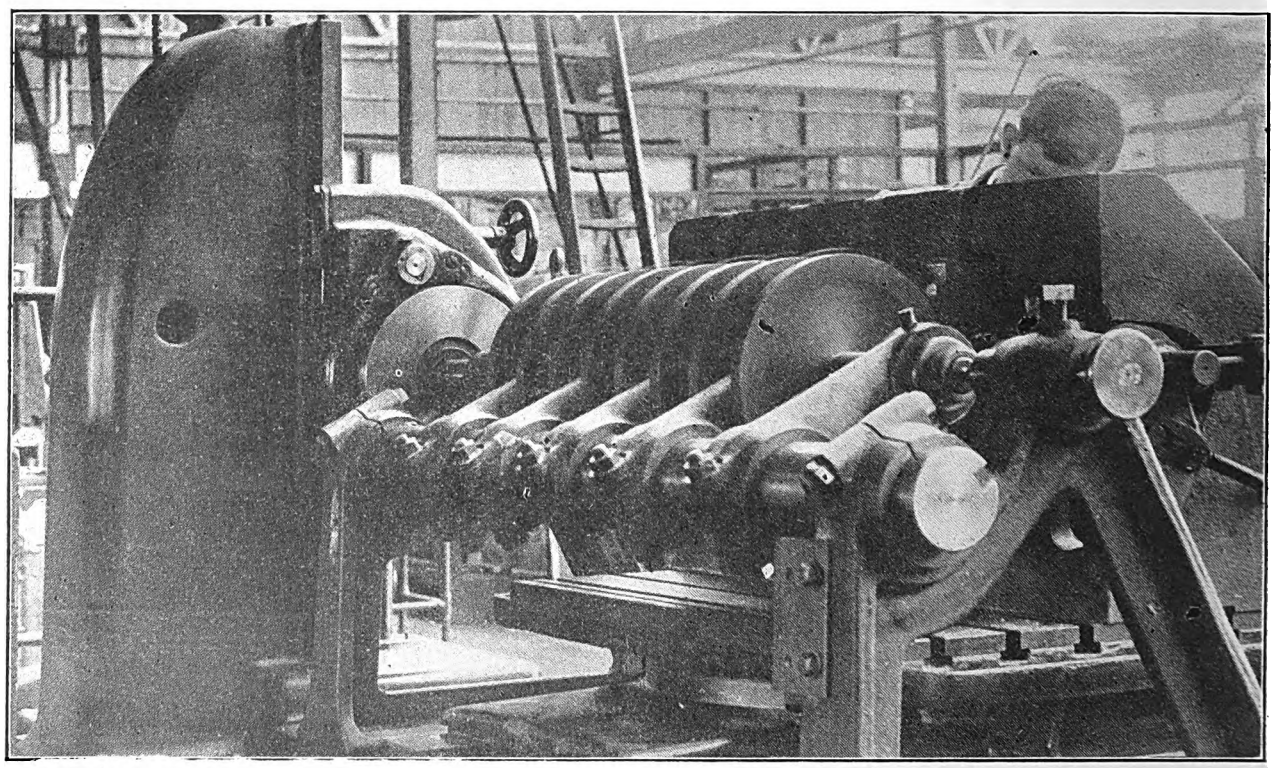
When the engines have run for two hours, first at 1,900, then at 2,000, and finally at 2,100 r.p.m., they are taken into the stripping-shop and pulled to pieces. Then they are put in a washing machine, where a conveyor belt takes them through a boiling alkali solution. Then they are wiped and laid out for inspection. If the inspector passes all the bits they are re-assembled and taken into the test-shop again and this time put on the Froude dynamometer, where they are run for an hour to register the power-curve, and to see whether the engine is developing the right power at the right speeds. If this final test is satisfactory the engine is ready for installation or for despatch.

If on stripping any faults are disclosed and replacements become necessary, and these are of a major character, the while process of testing has to be repeated.—Which may give some idea of why Aero-engines cost as much as they do.

—T. J.

SPECIFICATIONS.

	Gipsy I.	Gipsy I.	Gipsy III.
Bore and Stroke	114 x 128	114 x 140	114 x 140
Compression Ratio	5 : 1	5.2 : 1	5.2 : 1
Power output (fully co rected at max. R.P.M.) ...	98.5 at 2,100	120.5 at 2,200	122 at 2,200
Weight (dry including airscrew hub)	285 lbs.	295 lbs. (includes oil sump and airscrew spinner)	285 lbs. (dry sump. Includes airscrew spinner)
Weight per H.P. (max.) ...	2.85 lbs.	2.44 bs.	2.4 lbs.
Petrol consumption (at max. R.P.M. and max H.P.) ...	0.6 pts. per H.P./hr.	0.57 pts. per H.P./hr.	0.57 pts. per H.P./hr.
Oil consumption (at max. R.P.M. and max. H.P) ...	0.5—0.75 pts. per H.P./hr.	0.75—1.0 pts per H.P./hr.	0.75 - 1.0 pts. per H.P./hr.



SAVING TIME.—The crank-case-bearings in the D.H. Gipsy engine being faced in one gang-milling operation. The crank-case is invisible beneath the safety cover.

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—("Aeroplane" photograph.)

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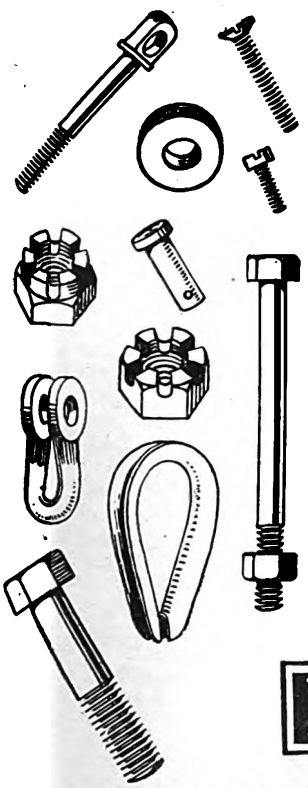

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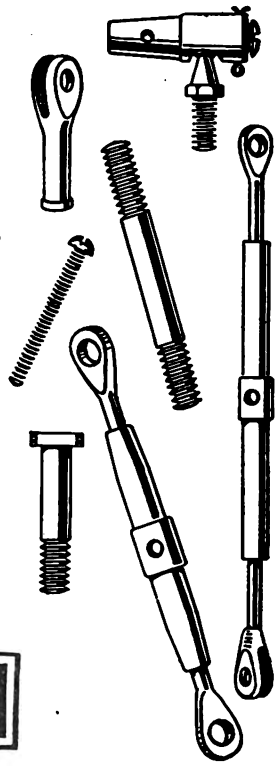

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THE GENET MAJOR.

The Genet Major is the latest addition to the well-known range of Armstrong Siddeley air-cooled radial engines. This engine is rated at 100 h.p. and therefore occupies a position midway between the 80 h.p. Genet and the 150 h.p. Mongoose. This engine made its first appearance at the 1929 Aero Show at Olympia, where its clean design and sturdy appearance created a most favourable impression.

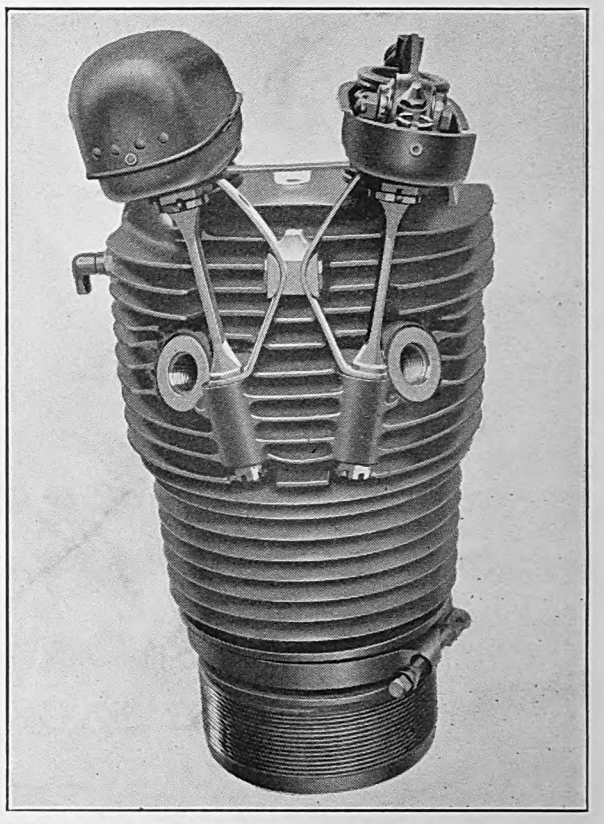
The engine is particularly suitable for the more highly-powered light aircraft, such as the Bluebird, the performance of which with this engine is comparable to that obtained with the most powerful engine at present available of the in-line type. The Genet Major has also been making a name for itself as a result of its behaviour with the Avro Five. This three-engined five-seat high-wing monoplane is carving out a name for itself with the aid of its Armstrong Siddeley engines.

The Genet Major can be obtained in the geared and ungeared form, though the performance of both types is the same.

The Armstrong Siddeley engines possess a number of features which are of particular technical interest. There is the patented method of securing the aluminium cylinder-head to the steel cylinder barrel, which provides a perfect gas-tight joint with good thermal contact, the extraordinarily simple and efficient patented means which has been adopted for holding the cylinders in the crank-case and the special system of assisting the distribution of gas by means of a fan.

The Genet Major is a five-cylinder engine and the cylinders are so arranged that the vertical one is at the bottom. This arrangement provides the least interference with the view from the cockpit. Each cylinder is machined from a forging and then has its lower end screwed into a steel adaptor. This end is then located in the crank-case and locked there with a double cone locking ring and screw. This system has the double advantages of distributing the pressure of the explosion over a large area of the crank-case and being easy to undo.

The two valves per cylinder are not interchangeable as they are made from different steels. Stainless steel is used for the inlet and cobalt chrome steel for the exhaust. Each rocker-arm is carried on two rows of ball-bearings which can be lubricated with a grease gun. A characteristic feature is the arrangement at the push-rod end of the valve-rocker where a loose pad for the flat end of the push-rod is formed by two cylindrical surfaces set at right angles to each other. This scheme provides universal motion and line contact which eliminates wear. The valve gear is totally enclosed in streamline covers.



The complete cylinder of a Genet Major, showing the compensator mechanism which is fitted to keep the clearances of the valve-tappets constant.

The crank-case includes the usual Armstrong Siddeley feature of a mixing chamber where a fan is used to promote proper mixing of the vapour and to ensure correct distribution to each cylinder.

The crank-shaft is carried in two roller bearings, the front one is fitted in the crank-case and the other in the rear cover. These bearings are close to the webs of the crank. A third dual purpose bearing is fitted to the front cover to take the thrust of the airscrew.

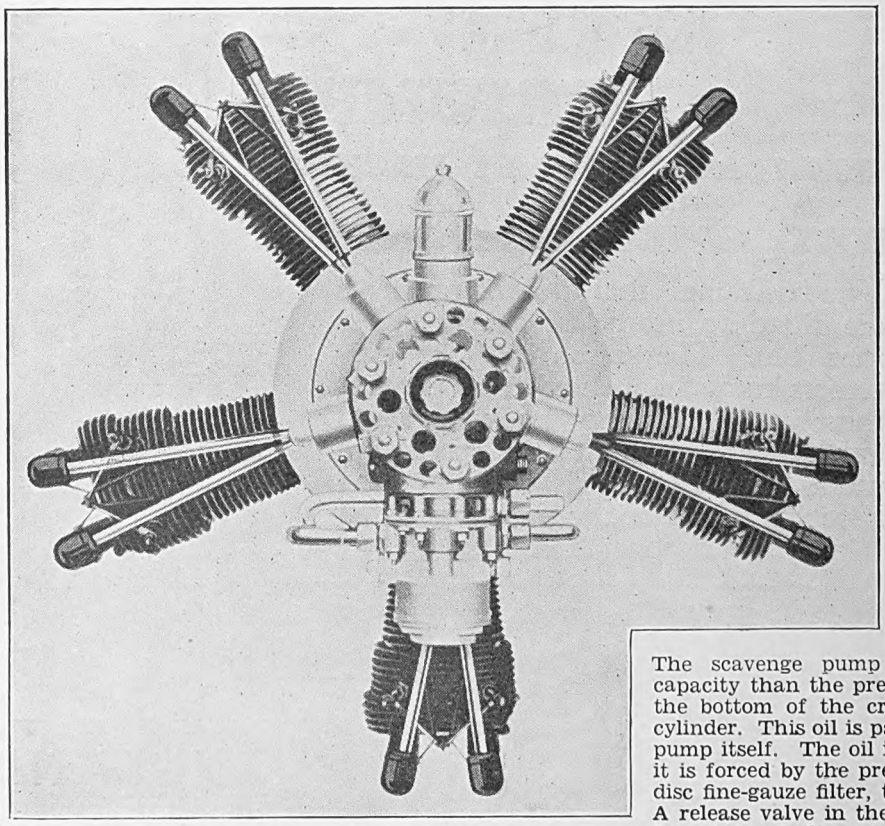
The master-rod and one half of the master-ring are formed from one steel forging which is machined all over. Two of the auxiliary rods are attached to this half of the master-ring and the remaining two are carried by the cap. All the rods are of H. section.

The mixture is supplied by one Claudel-Hobson A.V.48 carburettor which is mounted at the rear of the engine and delivers the mixture direct to the impeller.

The ignition system comprises two B.T.H. G.L.5 magnetos, one of which is fitted with an impulse starter.

Dry sump lubrication is used and the pump-unit which combines the pressure and scavenge pumps in one is very accessibly placed on the front cover. The scavenge pump which has a 50 per cent. greater capacity than the pressure pump draws oil from a sump at the bottom of the crank-case on each side of the bottom cylinder. This oil is passed through a cylindrical filter in the pump itself. The oil is then transferred to the tank whence it is forced by the pressure pump, after passing a multiple-disc fine-gauze filter, to the crank-pin by way of the crank. A release valve in the system prevents too great a pressure from being built up in the system.

For priming purposes a petrol primer is fitted and con-



The Genet Major.

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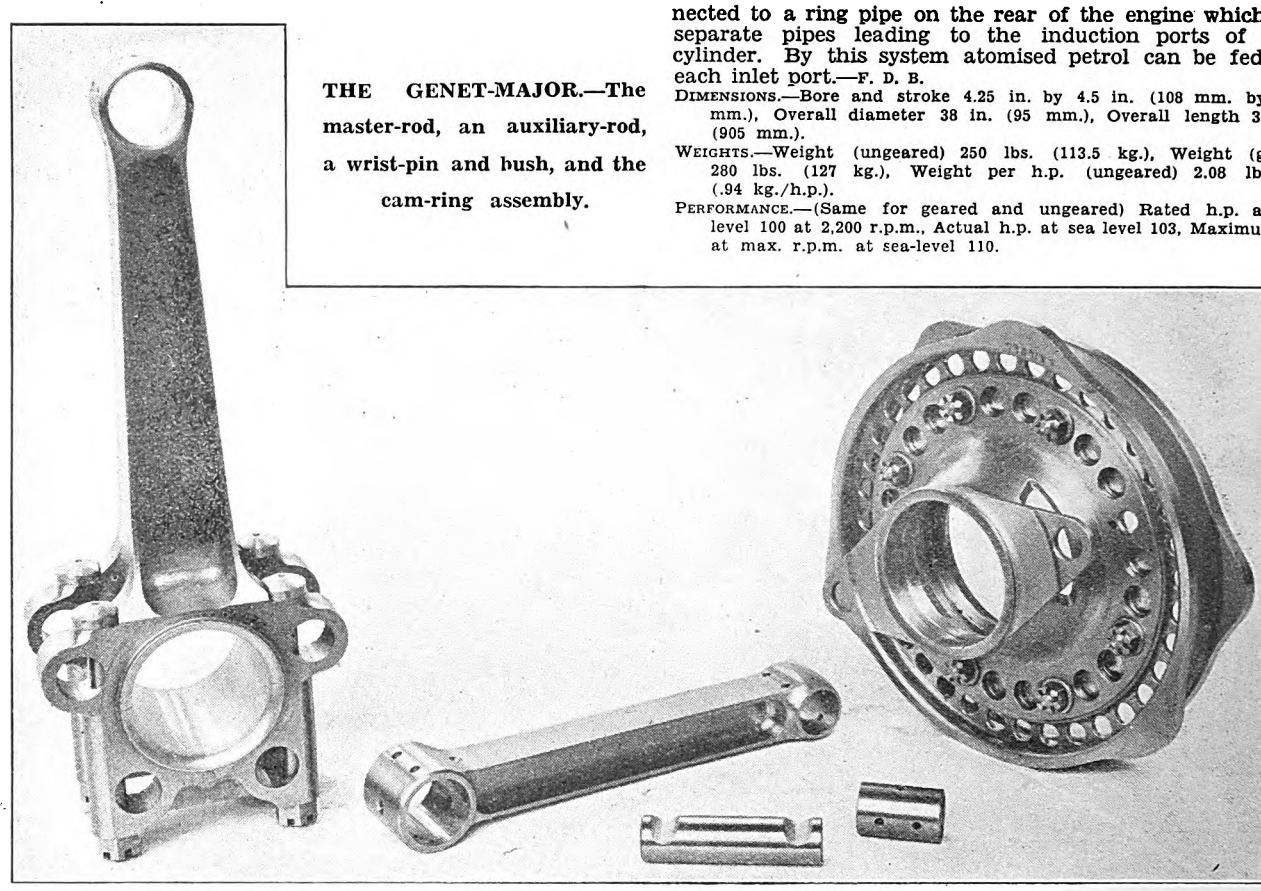

THE GENET-MAJOR.—The master-rod, an auxiliary-rod, a wrist-pin and bush, and the cam-ring assembly.

nected to a ring pipe on the rear of the engine which has separate pipes leading to the induction ports of each cylinder. By this system atomised petrol can be fed into each inlet port.—F. D. B.

DIMENSIONS.—Bore and stroke 4.25 in. by 4.5 in. (108 mm. by 114.3 mm.), Overall diameter 38 in. (95 mm.), Overall length 36.2 in. (905 mm.).

WEIGHTS.—Weight (ungeared) 250 lbs. (113.5 kg.), Weight (geared) 280 lbs. (127 kg.), Weight per h.p. (ungeared) 2.08 lbs./h.p. (.94 kg./h.p.).

PERFORMANCE.—(Same for geared and ungeared) Rated h.p. at sea-level 100 at 2,200 r.p.m., Actual h.p. at sea level 103, Maximum h.p. at max. r.p.m. at sea-level 110.

FLYING TESTS OF MODERN LIGHT AIRCRAFT.—III.

THE BLACKBURN BLUEBIRD.

[BY CHRISTOPHER CLARKSON.]

As is generally known the Bluebird is the only all-metal light aeroplane in this country and is now being produced in quantity by Saunders-Roe Ltd., of Cowes, under licence from the Blackburn Company. It may be fitted with either the D.H. Gipsy, the Cirrus III, the Cirrus-Hermes or the Armstrong Siddeley Genet engine and as with most types may be converted into a seaplane when required.

There is no doubt that side-by-side seating will have to come and the Blackburn Company deserve full credit for having been the first to build a light aeroplane of this type. Whether side-by-side seating is satisfactory in the present-day type of light biplane is a point on which much argument can be raised,—everyone to his or her taste.

Sitting beside one's passenger is a great deal more pleasant than behind. There is a feeling of companionship,—map reading and the argument about which way to go can be carried on more easily, anyhow as far as facial expression is concerned, though one doubts whether conversation by means of the normal shout is any easier than that from cockpit to cockpit with standard telephones and voice.

Also such an arrangement does, undoubtedly, have some psychological effect in inducing people to fly who would otherwise never dream of flying in a machine with separate cockpits.

Instruction, under many conditions, is simplified and the pupil can learn by watching what he would otherwise have to be told. There are aerodynamic advantages in the central position of the load, and weight should be saved by having only one set of instruments, windscreens and other accessories. On the other hand there are those who argue that restricted view and an abnormally wide fuselage, together with a certain loss of performance counter-balance these advantages.

The Blackburn Aeroplane and Motor Co. Ltd., as the pioneers of the side-by-side seating in this country, have had the usual uphill fight to gain their objective, and the Bluebird is at present the only English biplane of that type.

During several flights in a Bluebird lent by Auto Auctions Ltd., who are the World distributors for this make of aircraft, one had plenty of time to study these points.

The machine flown was a standard Gipsy-engined model without slots and was flown with and without a passenger. The climb was 2,000 feet in 2½ minutes and 4,000 feet in 5 minutes. The Air Speed Indicator gave a reading of 93 m.p.h. at 2,050 r.p.m. full out and a touring speed of 80 m.p.h. at 1,850 r.p.m. [Presumably the A.S.I. was feeling pessimistic that morning.—ED.]

The machine takes off quickly, provided one gets the tail well up, otherwise it is apt to bounce across the aerodrome without showing any signs of becoming permanently unstuck.

On the glide the controls are quite normal, and the machine handles pleasantly, except that the actual gliding angle appears to be rather steep.

The landing speed is about 45 m.p.h. and the machine sinks quickly onto the ground without any float.

Once on the ground it pulls up remarkably quickly and in a very short space. This is a great attribute and one which should receive more attention than it does.

The fore-and-aft and the directional controls are well balanced, progressive in feel as the speed increases, and efficient at all speeds.

The machine flown was inclined to be heavy laterally, and there was a slight lag between the movement of the stick and the resultant movement of the machine. Also, during the take-off the ailerons were slow in taking effect and one got the impression that a cross-wind take-off would not be pleasant. This control, however, has a normal amount of feel on it and shows the approaching stall quite well.

In a straight-forward stall this machine was normal, the nose sank gently and answered to the fore and aft control almost at once. But when stalled on a climbing turn or with one wing down it showed a tendency to flick rapidly into a spin and some height was lost before recovery could be made.

As regards comfort, the cockpit of the Bluebird is remarkably free from draught, and is comfortable to sit in except that the distance between seat and rudder-bar is rather short for a tall man. The instruments and engine switch are very neatly fitted into the dashboard, but no bubble is included.

The petrol-cock is within easy reach. The throttle is set on the bottom of the instrument-board in the middle, two pigeon-holes are provided in the dash, and map pockets are made in the side of the cockpit. The whole cockpit arrangement is very neat, and entry is easy by a door at each side in the fuselage.

As regards the controls themselves, the stick is just too

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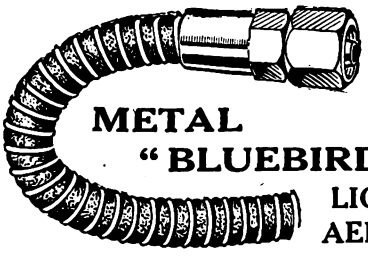

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short, and would be greatly improved by being a few inches longer. This is a modification one could do oneself, and it may be included in the new model. Both sticks and rudder-bars are easily removable.

A good point is the fitting of an adjustable tail-plane. The incidence lever is placed between the seats. In the air there is a noticeable absence of vibration and the engine is well silenced.

The view is moderate. Below and ahead on the side you are sitting it is good, but to the other side it is cut down by the wide fuselage. Also the engine minimises this area by preventing one from seeing forwards and downwards to the opposite side. Above are the main planes, so that a machine overtaking at a higher level is soon lost. A good view behind can be got by turning round. When taxying the engine and fuselage completely block out the opposite side, so that it is necessary to half-stand on the rudder-bar to see where one is going. An inverted engine would improve the pilot's view tremendously, but one realises that this is part of the price which must be paid for having side-by-side seating.

The machine handles satisfactorily on the ground and the tail can be lifted round by hand. The finish is good.

A large luggage-locker just behind the cockpit, running across the fuselage, will just take a special suit-case,—which Auto-Auctions Ltd. sell at 5 guineas. A locker for golf clubs or fishing rods can be fitted into the top of the fuselage for an extra cost of £6 16s.

Owners are well supplied with service and depots where they can get spare parts, as these are obtainable at Heston, Brough, Cowes or Hanworth.

The following gives the maker's performance figures for the Bluebird with the various engines which may be installed:—

PERFORMANCE.

	HERMES.	GIPSY	CIRRUS III.	GENET MAJOR.
Speed Max.	112 m.p.h.	103 m.p.h.	100 m.p.h.	112 m.p.h.
Cruising speed... ...	94 m.p.h.	86 m.p.h.	85 m.p.h.	94 m.p.h.
Landing speed	44 m.p.h.	44 m.p.h.	44 m.p.h.	44 m.p.h.
Initial rate of climb ...	730 ft./min.	720 ft./min.	700 ft./min.	730 ft./min.
Cruising Range ...	320 miles	470 miles.	480 miles	320 miles
Price	£865	£795	£795	£975

ACCESSORIES BEFORE THE FACT.

IN THE STORES.

The raw materials for the construction of the Blackburn Bluebird are assembled in the stores beneath the Maresfield Works. These are divided into two parts, one of which is for material approved by the A.I.D. In these stores one finds steel tubes from Accles and Pollock Ltd. There are bins full of nuts from Rubery Owen and Co. Ltd., and from Brown Brothers. There are racks full of Duralumin sheets and Duralumin tubes from James Booth and Co. Ltd., and there is aluminium sheet also. The sacks of rivets have come from Baxter's Bolt, Screw and Rivet Works. There are bars of stainless steel from William Jessop and Sons Ltd.

In the finished parts stores is kept everything that will be needed on the assembly line. The first thing that one notices is a row of aero-engines which are strategically placed beneath the overhead crane. These are Cirrus, D.H. Gipsy, Cirrus-Hermes or Genet Major as the occasion demands.

There is a collection of tinned-steel fuel-tanks which have been made by J. H. Randall and Son Ltd., and the Gallay Radiator Co. Ltd.

The safety belts come from the De Havilland Aircraft Co. Ltd.

The fire extinguishers, which are fitted to each machine, come from the Pyrene Co. Ltd.

The wooden airscrews are made by the Airscrew Company Ltd.

The wheels and tyres complete and ready for assembly on the undercarriage are made by the Dunlop Rubber Co. Ltd.

Gadgets like cocks and filters come from Benton and Stone Ltd.

The Petro-Flex tubing is supplied by Hobdell Way and Co. Ltd.

There are sheets of safety glass from The Triplex Safety Glass Co. Ltd., for the windscreens.

Various sub-contractors have made quantities of detail parts and one can see the products of the Monarch Engineering Co. Ltd., Atalanta Ltd. (a firm which is staffed and managed entirely by women), and the Pyne Manufacturing Co.

Vickers (Aviation) Ltd. supply special petrol cocks and a variety of special fittings.

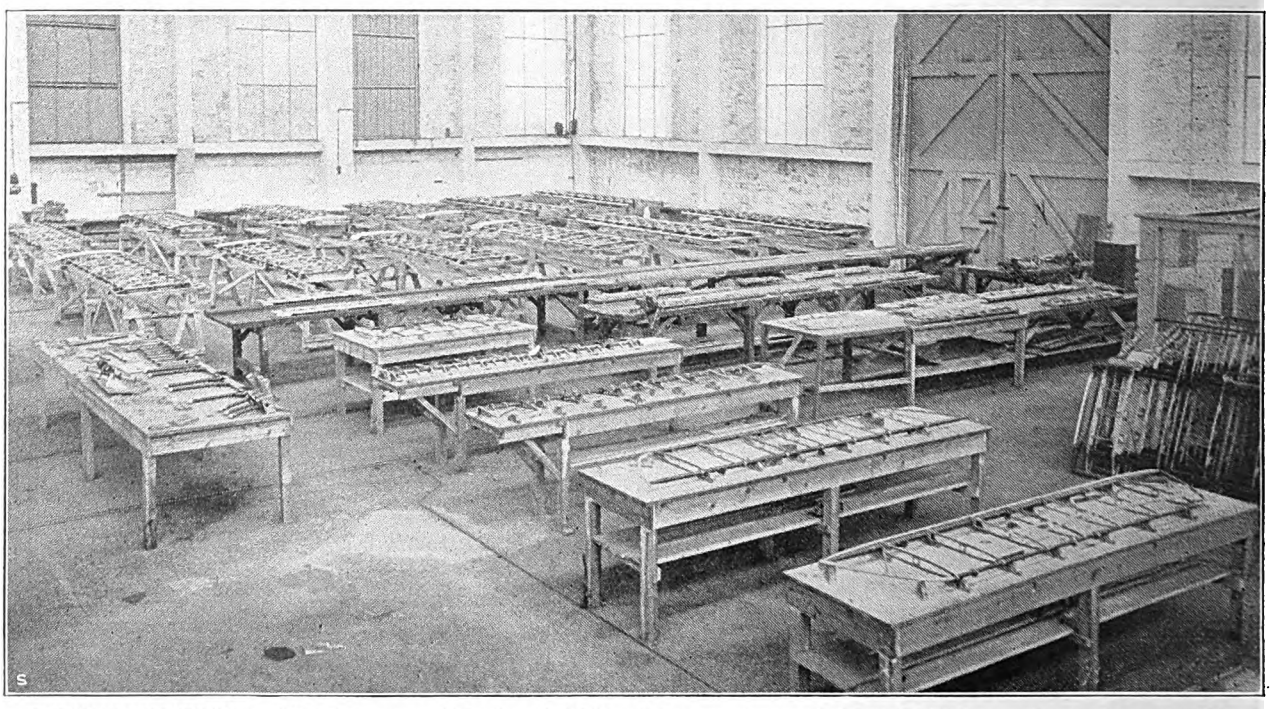
The Dope and Covering Shops consume a quantity of material. The dope comes from Cellon Ltd. The various tapes and fabrics have come from Stevenson and Son Ltd., from Thomas Sinton and Co. Ltd., and from the Ulster Weaving Co. Ltd.

ACCLES TUBES FOR THE BLUEBIRD.

Mention has already been made in another part of this issue of the particular advantages that a system of metal construction offers for the production of aircraft in quantities,—or series, as our French neighbours call it. Outstanding features of the construction which is used in the Blackburn Bluebird are the system of mechanical joints made with extremely few parts and these of the simplest design.

The use of one size of tube only has made this possible. This uniformity of tube sizes has further advantages, both from the view-point of the manufacturer and the supplier. Material can be ordered in relatively large amounts instead of being split into a number of orders for tubes of varying dimensions.

The whole of the weldless steel tube which has been used



BITS AND PIECES.—The Component Parts of all the flying surfaces of the Bluebird on the main Assembly Jigs in the Works of Saunders-Roe Ltd.

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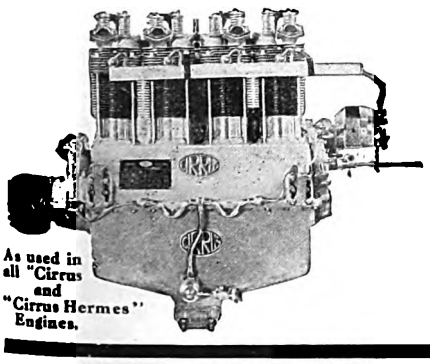

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in the Bluebirds which have been built to date has been supplied by Accles and Pollock Ltd., who consider this to be a very high compliment. This firm has probably had a longer experience of tubular construction for aircraft than any other firm in the World. As long ago as 1908 they made experiments with streamline tubes for the Wright Brothers.

Many improved methods of aircraft construction have been developed in the shops of Accles and Pollocks Ltd., a section of whose staff spends its while time in making tests and experiments to decide the most suitable material and methods of production for every conceivable tubular part of an aircraft structure.

The result of all this work is that Accles and Pollock Ltd. place at the disposal of aircraft builders and designers a comprehensive knowledge of all the possibilities of tubular construction. They are always prepared to make experiments, and to place their experience at the disposal of aircraft firms who consult them.

ADCOL FOR BLUEBIRDS.

Alexander Duckham and Co. Ltd. are widely known as manufacturers of lubricants, a recommendation in itself is the fact that they are on the approved list of oil suppliers to the Air Ministry, which is entirely satisfied with the products of the firm and the manner in which they are manufactured.

Duckham's Adcol New Process Oil, which is known as Aero N.P.5, surpasses the requirements of the Air Ministry's specification D.T.D.109-P.4, which is probably the most exacting test in the World for aero-engine oil. This oil is officially recommended for use with the Bluebird, as Cirrus Aero Engines Ltd. recommend it for the Cirrus engine, and the De Havilland Aircraft Co. Ltd. recommend it for the D.H. Gipsy.

AIRSCREWS FROM WEYBRIDGE.

Under the generic name of airscrew is included the tractor and propeller varieties, and even the wind-driven miniatures which actuate generators and pumps on certain types of aircraft. The Airscrew Company, Weybridge, Surrey, makes them all in any size.

A special department of the factory turns out tractors for light aeroplanes on real mass-production lines, but airscrews of more ambitious proportions, such as the 16 ft. screws for the R.101, are all in the day's work at Weybridge.

The Company specialises on wooden airscrews, which are still the most favoured type in all branches of aviation, and will manufacture airscrews to meet any specifications. Their attractive and impressive display at the Olympia Aero Show last year will be remembered by those interested in this vital branch of aeronautical engineering.

Their airscrews have given faultless service in practically all the great flights by light machines and many of those by heavier craft.

ANGLO-AMERICAN ESSENCE.

Pratt's Aviation Spirit has universal application in the flying world. In other words, it is not used only for specialised engines or undertakings, but for general use, and can yet be specialised for the utmost achievement in any one line.

The Anglo-American Company were, incidentally, the first to commercialise the famous Ethyl petrol, doped with T.E.L. This form of doping has decided advantages over the use of benzol as the quantity of T.E.L. used is small and can be carried in the machine if the engine requires doped fuel but is travelling in regions where nothing but ordinary petrol is available.

Among the famous feats performed on Pratt's were Lindbergh's Atlantic flight, the winning of the 1929 Schneider Contest and the setting of the World's highest speed on the Supermarine Rolls-Royce S.6 seaplane last year, also the World's light aeroplane speed record on the D.H. Tiger-Moth.

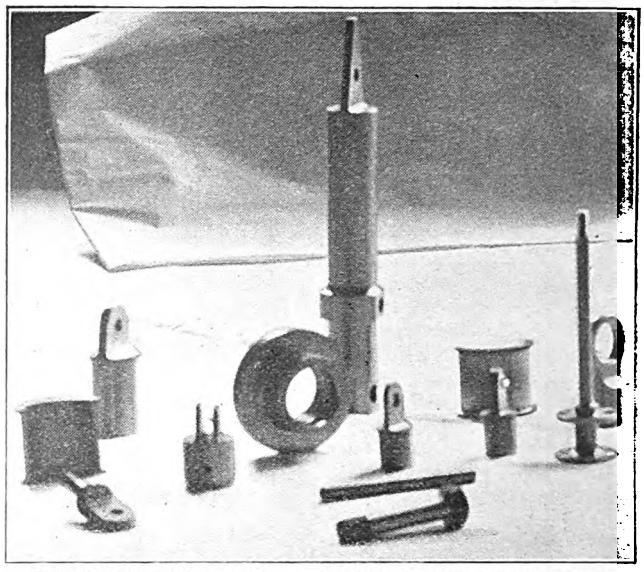
"High test" has come to be almost a synonym for Pratt's and it lives up to its name.

ATALANTA LTD.

Soon after the War 1914-18 a number of girls who had been doing war-work got together and formed a company in which Lady Parsons became interested. This firm was called Atalanta Ltd. and it has been forging ahead steadily ever since, so that five years ago it had to move to new premises.

This concern is extraordinarily interesting. The executive, the staff and everybody connected with the company are all women, who have managed so successfully that Atalanta Ltd. has been doing sub-contract work for Saunders-Roe Ltd. and other aircraft firms. They have made a quantity of machined fittings for the Bluebird, and the entire order has been up to A.I.D. standard.

Atalanta Ltd. have already done a lot of work for the Westland Aircraft Company and the Gloster Company, so they have had a good deal of experience of aircraft work. They have just completed an order for Armstrong Whitworth of special rolling mills for steel strip.



VARIETY.—The various machined jobs made for the Bluebird by Atalanta Ltd.

The Air Ministry keeps a fatherly eye on the firm, which is visited when the occasion arises by an A.I.D. inspector. One heard the other day that the workmanship and deliveries of this firm were surprisingly good, not, mark you, in comparison with similar feminine organisations (if there be any), but purely on its merits in comparison with reputable firms run by experienced men.

BAXTER'S RIVET WORKS.

The rivets for the Blackburn Bluebirds have been supplied to Saunders-Roe Ltd. by Baxter's Bolt, Screw and Rivet Works, of Birmingham. This firm has specialised in the manufacture of bolts, screws and rivets for many years.

But though old-established the firm is well abreast of the times and can supply all the rivet requirements of Aviation. In fact they are already producing rivets of a novel kind for a new process which is particularly applicable to aircraft and will be shortly described in THE AEROPLANE.

BENTON AND STONE LTD.

Benton and Stone Ltd. are very well known as manufacturers of aircraft parts to the Air Ministry A.G.S. numbers. They make a very large variety of filters, draincocks, unions and the like, in non-ferrous metals, and from this range they have supplied material to the constructors of the Bluebird, Saunders-Roe Ltd.

B.T.H. MAGNETOS.

Among the accessories which have been the frequent subject of congratulatory telegrams to the makers from satisfied aviators is the British Thomson-Houston magneto. Two of these are used on each Gipsy and Cirrus, among the four-in-lines, and on the Genet among light radials. Their sturdy simplicity makes them deservedly popular.

The AG4-4 type, as used on the Gipsy III, is an example of the four-in-line type. It is base-mounted, and the base, with distributor and driving end-plates, is cast in one unit. The armature space and the bearings are machined at one setting to ensure exact alignment. A rotary safety gap is used to avoid undue ionization and high temperatures.

The GL-5 type, as used on the Armstrong Siddeley Genet, differs from the AG4-4 in being spigot-mounted and revolving at 1¼ times crank-shaft speed in order to provide five sparks during every two revolutions.

Nickel is used for the distributor segments and distributing electrode of both models, as it gives long wear and freedom from pitting. Contacts are of iridio-platinum.

An impulse-starter is used on at least one of the two magnetos on all light engines using the B.T.H. By means of a pawl, which drops into a stop on the end-plate at slow rates of revolution, the armature is held stationary against a coil-spring which winds up as the drive-shaft continues to revolve. At a pre-arranged position of the drive-shaft a cam overtakes the pawl on the armature assembly and lifts it clear of the stop. The armature is flicked by the spring into its normal position relative to the drive-shaft, thereby causing an intense spark. When the engine is turning at over 160 r.p.m. the pawls are held out of action by centrifugal force.

CELLON DOPE.

The Blackburn Bluebirds which have been built by Saunders-Roe Ltd. have all been doped with Cellon materials. Among these finishes are the standard blue and silver of the Bluebird, also the distinctive orange and black of National Flying Services.

The question of exterior finish and colour scheme is be-

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IN YOUR

BLUEBIRDS:

ALL THESE MACHINES ARE FITTED WITH PARACHUTE SEATS TO ACCOMMODATE IRVIN AIR CHUTES.

SAFETY FIRST!

IRVIN AIR CHUTES HAVE SAVED OVER 270 LIVES THROUGHOUT THE WORLD.

IRVING AIR CHUTE OF GT. BRITAIN, LTD., LETCHWORTH, HERTS.

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Telephone: Letchworth 370.

"SINTONA" AEROPLANE LINEN FABRICS

to BRITISH and FOREIGN SPECIFICATIONS.

(AS USED ON "BLACKBURN BLUEBIRD" BUILT BY SAUNDERS-ROE OF COWES)

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Telegrams: Sinton, Tandragee.

Selling Agents: J. W. GATES & Co., 133, Oxford Street, London, W.1.
Telegrams: Gates, London, Regent 1164. Telephone: Regent 1164.

Every "Bluebird Cirrus" carries this protection.

Carry one on your 'plane and on your car as well.
THE PYRENE COMPANY, LTD., Great West Road, Brentford, MIDDLESEX.
Telephone:— Ealing 6012 (7 lines). *Telegrams:— "Pyrene, Brentford."*

THE ULSTER WEAVING CO., LTD.
LINFIELD ROAD.——————BELFAST.

Manufacturers of all classes of
LINEN AIRCRAFT FABRICS.
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PARACHUTE CLOTHS, ETC.

As used in the Bluebird.

On Air Ministry Approved List.

Stocks of Standard Makes always Available.

Telegrams—LINFIELD, BELFAST.

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ginning to attract a great deal of attention; people buy standard types, but they wish to be distinctive. Identification letters are not enough. There is growing up a general tendency for attractive individual lay-outs, and Cellon Ltd. are in an excellent position to meet this demand. Cellon Dope and Cerric Lacquers will produce special colour schemes with a finish that cannot be excelled by paint and varnish.

CLAUDEL-HOBSON CABURETTORS.

A wide range of light aircraft engines now use the Claudel-Hobson carburettor, which has earned a name for dependability in a number of world-famous flights as well as in daily service on light training machines all over the world.

Starting with the smallest, Claudel-Hobson carburettors are now fitted to the A.B.C. Scorpion twin-opposed 40 h.p. aero-engine as well as to its doubled counterpart, the 80 h.p. Hornet. The Genet and Genet Major engines of 80 and 100 h.p. respectively, also use these carburettors, and they are being used on the later models of the Gipsy II and III.

Claudel-Hobson carburettors have three jets: the usual idling jet, the main jet, which is in action at all speeds above idling, and the power jet, which only comes into play at practically full throttle, and gives ample power in this position while producing utmost economy at cruising speeds. An air-valve opening into the emulsion chamber permits adjustment for altitude during flight, which is a feature of great value when flying over varying country and through different climates.

DUNLOP RUBBER COMPANY.

The Blackburn Bluebird is fitted as standard with the most modern type of wheel and tyre. The design and construction of this equipment is such as to give complete confidence in taxying, take-off and landing.

The wheels are made by the Dunlop Rubber Co. Ltd. and are of the wired type with well-base rims. These wheels are extremely strong and light. Their rims are made in one piece and are therefore free from loose flanges and other detachable parts which might affect the safety of the machine.

The tyres are also made by the Dunlop Rubber Co. Ltd. and are of the wired or inextensible edge type,—a type which offers special advantages when difficult landings have to be made with tyres which for some reason have lost pressure or become deflated. The maintenance of a wired tyre within the rim is entirely independent of the pressure of inflation, because the edges of the tyre are made with rings of steel wire which are smaller in diameter than the flanges of the rim.

The edges of this kind of tyre cannot be stretched over the flanges of the rim by either accident or design. For removal the tyres have to be manipulated in a special manner which cannot be reproduced in any accidental fashion. This means that the tyres cannot be pulled off the wheels short of completely wrecking both.

The chief aim in Dunlop tyre and wheel practice is to ensure safety. Only the finest materials are used by the Company in the manufacture of tyres and wheels for aircraft, and nearly all these materials are controlled from their source. The high quality of these materials, expert technicians, specially trained workers, the most modern plant and research facilities combine to produce a product as nearly approaching perfection as is humanly possible.

DURALUMIN MANUFACTURERS.

The Blackburn Bluebird is built entirely of metal except for the covering of the wings, control surfaces and fuselage, and the upholstery of the cockpit. This metallic structure is built of steel tube and duralumin. The latter material is used extensively for ribs, control surfaces, fuselage bulkheads and cowling, engine bearers and fairing, formers and longitudinals.

Duralumin, or rather Vicker's Duralumin, is the registered trade mark for the aluminium-copper alloy produced by James Booth and Company (1915) Ltd. This alloy contains aluminium-copper, manganese and magnesium in the proportions of about 94.5 per cent., 3.5 to 4.5 per cent., .4 to .7 per cent., and .4 to .7 per cent. The properties of this remarkable alloy are widely known now-a-days. It weighs about one-third of the same volume of steel and has a tensile strength of about 25 to 30 tons per square inch.

James Booth's supply this material to meet the requirements of the B.E.S.A. specifications, so no useful purpose is served by giving in full the mechanical properties of this alloy in its multifarious forms; anyone who wants these figures can turn them up in the B.E.S.A. specifications 3 L 3 for sheet, 3 L 1 for bar, and 3 T 4 for tubes.

The firm can supply ingots of the metal for casting if required, though duralumin is rarely used in its cast state because its mechanical properties in this condition are very little better than those of ordinary cast aluminium alloys.

Rolled duralumin in the form of sheet and strip is widely used in the metal construction of aircraft. James Booth supplies sheets in all gauges (S.W.G.) down to 32 and in all widths up to four feet and in any length up to twelve. The one exception to this is that sheets below 26 gauge cannot be supplied in widths greater than three feet. Purchasers should remember, however, that the standard sheets are six by two feet and six by three feet and a quicker delivery can be given for such sheets.

A particularly useful form of duralumin is strip, and James Booth supply this in any gauge down to 33 and sheared to any width between three-eighths of an inch and two feet. The strip can be supplied in straight lengths or coils in lengths that range in the thinner gauges from 60 to 40 feet, and in the thicker gauges from 40 to 20 feet.

James Booth manufacture an extensive range of tubes made from duralumin. These can be supplied up to a length of 18 feet in any outside diameter between three-sixteenths of an inch and four inches. Tubes not greater than one and a-half inches in diameter can be supplied in gauges down to 26. The firm will be pleased to supply particulars of the minimum gauge of tube that can be manufactured for any specified diameter. The firm also manufacture duralumin tubes in a variety of shapes, such as square with sharp or round corners, streamline, oval and special shapes which the exigencies of design may make necessary.

The rest of the products of the firm are so numerous that they can only be enumerated: these are rods, hammered bar, drop forgings, wire and rivets.

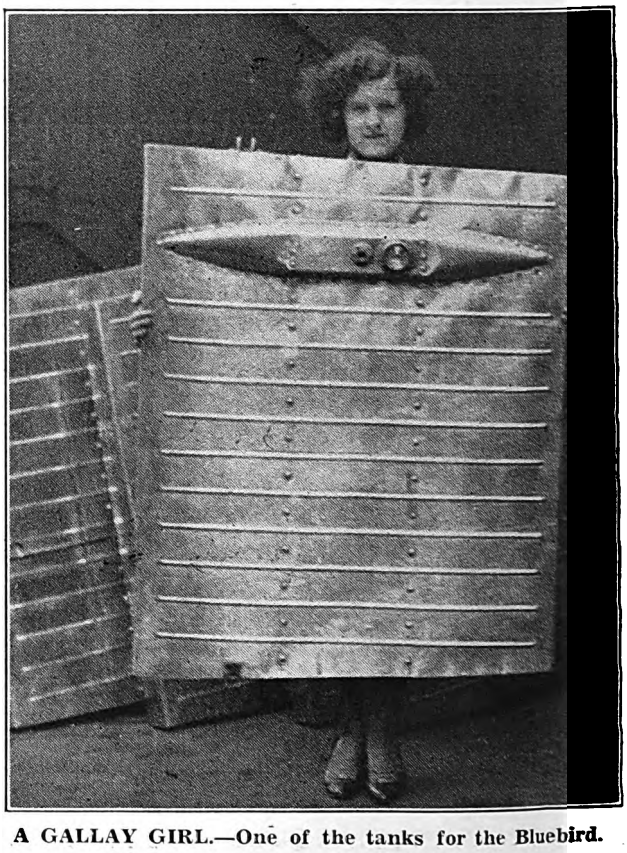
James Booth are particularly well-known for the manufacture of rolled and drawn sections, forms in which duralumin is particularly useful to the aircraft industry. These sections in the form of angles, channels, flanged-channels, corrugated sections and streamline sections can be manufactured in any appropriate gauge from 26 to 8, and in sizes which are made from strips from one-quarter to 15 or 18 inches in width.

The firm specialises in extruded duralumin sections, the thickness of which varies from 16 gauge upwards. Their range is so extensive that one is pretty certain to obtain just what one wants by asking for it.

Although the products of this firm have had to be treated in a more or less cursory fashion, probably enough has been said to show how well-equipped James Booth and Co. (1915) Ltd. are to deal with prompt supplies of duralumin in every conceivable form.

GALLAY TANKS.

The petrol tanks for the Bluebirds, as supplied to Saunders-Roe Ltd., are made by the Gallay Radiator Co. Ltd., of Scrubbs Lane, Willesden, who are among the pioneers of makers of tanks and radiators for aircraft.



A GALLAY GIRL.—One of the tanks for the Bluebird.

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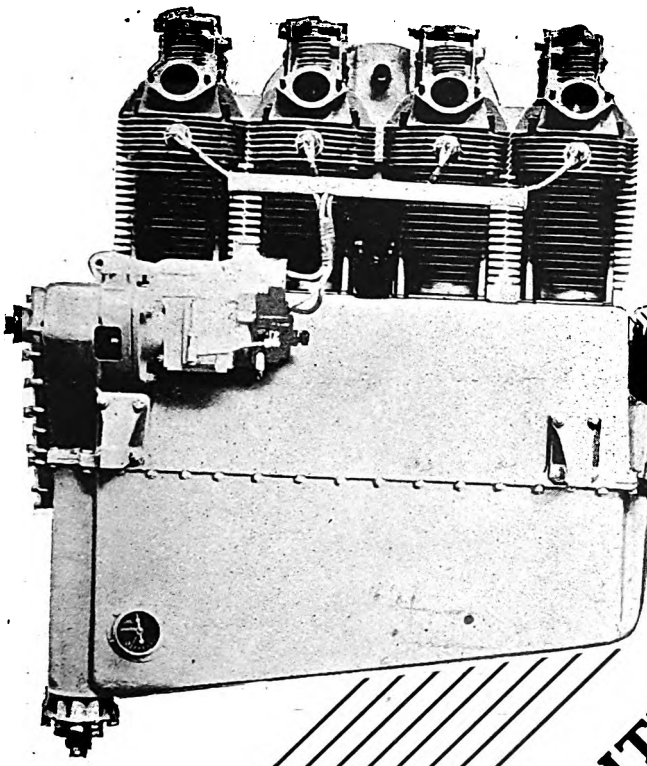

CIRRUS HERMES ENGINE, as used in BLUEBIRD Aeroplane, built with Castings made at BIRMID WORKS

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QUALITY AERO CASTINGS IN IRON OR ALUMINIUM

Experience and the best equipment necessary for the production of quality castings, enable us to meet the most exacting requirements of the Aircraft industry.

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AEROPLANE FABRICS

AS SUPPLIED TO

SAUNDERS-ROE LTD. FOR USE ON THE "BLUEBIRD"

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MOYGASHEL MILLS,
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FIRST AEROPLANE TANK MADE IN 1908.

We are on the Air Ministry List of Approved Firms and supply the Petrol Tanks used on the BLUEBIRD LIGHT AEROPLANE.

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FOR THE BLUEBIRD

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PARADE, BIRMINGHAM.
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During the War 1914-18 the firm had an enormous output of radiators and tanks for the big American flying-boats, F.E.2bs. and Sopwith Dolphins. For the Dolphin they achieved the remarkable feat of turning out a radiator weighing only 22 lbs. to cool a Hispano-Suiza engine of 250 h.p. The lightest weight of any alternative radiator for that engine was 50 lbs., and even at that weight did not always keep it cool. In this connection some of the old-timers will recall an alternative engine for the Sopwith Dolphin which had a fascinating habit of setting fire to its own airscrew,—though that has nothing to do with radiators.

Among the more interesting work done by the Gallay Co. was making the experimental radiators for the original twin-engined "giant bomber" designed by Squadron Commander Dyott, then R.N.A.S., and now more famous as an explorer in Peru and India. Also the Gallay Co. made the first Imber Patent Safety Tanks, which were so successful in the Government's Safety Tank Competition from which nothing ultimately developed.

The Gallay firm are convinced of the future importance of Civil Aviation and will be glad to hear from all who want special tanks made either in quantities or experimentally.

JOHN HALL AND SONS.

John Hall and Sons (Bristol and London) Ltd. are well-known glass merchants and craftsmen. They also manufacture paint, varnish and cellulose lacquer. The Company first entered the Aircraft Industry during the War 1914-18 when they manufactured large quantities of varnishes for the protection of woodwork. They were re-approved as official manufacturers by the Air Ministry some six years ago. To-day they can supply any variety of paint, varnish or dope.

Mr. St. John Plevins, who is well-known to all the aeronautical community, is manager of the Aircraft Department of the firm. He is to be found at 173, Pancras Road, N.W., which is John Hall and Sons' London Office and Warehouse.

HANDLEY PAGE AUTOMATIC SLOTS.

The first Bluebird to be fitted with Handley Page Automatic Slots was the machine which was supplied to the Mitsubishi Kokuki Kabushiki Kaisha of Japan. The Handley Page Automatic Slot was first fitted to light aircraft in 1928 and since that date more and more aircraft in this category have been fitted with slots.

Provision is made for slots on the Bluebird and they can be ordered as an extra. They are fitted at the wing-tips of the upper wing and are arranged to open as the flying speed falls off and stalling speed is approached. Their function is to reduce the tendency for a stall to develop into a spin.

As is generally known the value of slots is known and appreciated all over the World. They are a standard fitment in the R.A.F. and numerous foreign Governments have taken them up. As a safety device Handley Page Automatic Slots may be regarded as a four-wheel braking system, and all cars have four-wheel brakes now-a-days.

THE IRVIN AIRCHUTE.

The number of light aeroplanes which now fit seats to take the seat-type parachute effectively dispels any feeling that the exit from a light aeroplane is too cramped to allow parachutes to be used in emergency. The Blackburn Bluebird is the latest light aeroplane to fit seats to take parachutes for the effective use of which the machine is particularly suited.

The side-by-side seating and side doors of this machine offer exceptionally favourable exits for emergency jumps. The roomy cockpit permits the crew to wear seat packs without the slightest inconvenience. This is due to the combination of a small, light and compact pack and the special seats. The Irvin Seat Pack replaces the ordinary cushion and is particularly comfortable as a neat Capok pad is fitted on top of the pack.

The Irvin Air Chute for light aircraft and the private owner is identical with that used as standard equipment by the R.A.F., which has already saved over 260 lives. In one month seven R.A.F. pilots saved their lives with Irvin Air Chutes.

The material, workmanship, performance and factor of safety of the Irvin Air Chute for light aircraft and the private owner are of the same high standard as are the military type. The silk canopy is 24 feet in diameter and has attached to it by a shroud line the usual Irvin pilot chute. When the ring is pulled, this pilot chute springs from the pack and helps to pull out the canopy. It also flings the canopy to its maximum distance from its wearer so that the canopy does not open in dangerous proximity to him. The pack weighs 18 lbs. The sinking speed of the Air Chute under load is 21 feet per second.

The Irvin Quick Connector, which was described in THE AEROPLANE for April 16, is also suitable for use in light aircraft, but only for the passenger, as the pack when worn depends from the front of the harness. The Quick Connector is simply a standard Irvin Air Chute made detachable from its harness. The passenger can thus hang the pack to the side of the cockpit or cabin and leave it there till wanted, when it can be attached in less than a second with a simple arrangement of link and hook.

THE IRVIN AIR CHUTE.—Mr. Leslie Irvin, the inventor, founder, and for many years the demonstrator of the Irvin parachute.

WILLIAM JESSOP AND SONS.

William Jessop and Sons Ltd. is a famous steel firm with depots, agencies and branch offices all over the World from Tokyo to Buenos-Aires and Johannesburg to Oslo. The firm was founded some time before 1750, so its experience of steels is somewhat extensive.

Their products figure prominently in the Bluebird as they have supplied material to the Blackburn Company, to Saunders-Roe and to Cirrus Aero-Engines Ltd.

KAYSER, ELLISON'S VALVE-STEELS.

The well-known K.E. 965 steel is used to make the valves in the Cirrus, Cirrus-Hermes and D.H. Gipsy Engines. This steel is supplied by Kayser, Ellison and Co. Ltd., of Carlisle Works, Sheffield. The valves of aero-engines have to work at high temperatures and if they are to maintain their shape and not cause trouble by permanently stretching after long runs, valves must be made of steel which has a very high tensile strength at such temperatures.

At a temperature of 900 degrees Centigrade the tensile strength of K.E. 965 does not fall below an average of 16 tons per square inch. This figure is considerably higher than can be obtained from the steels which have hitherto been used.

The hot gases are highly corrosive and erosive in their action, but K.E. 965 is of such quality that, as has been proved in practice by the Cirrus, Cirrus-Hermes and Gipsy Engines, valves made of it retain the proper seating surface which is essential for the highest efficiency.

Further good qualities of this steel are that it is not affected by different conditions of atmosphere nor by the corrosive action of salt spray. Also K.E. 965 steel has a remarkable degree of ductility, which is a further safeguard against valve trouble.

LODGE PLUGS.

Cirrus Aero Engines Ltd. use and approve the Lodge standard A-21 (18 mm. thread) long-reach aviation plug in the Cirrus and Hermes engines,—which are two of the four standard power units with which the Bluebird can be had.

Lodge Plugs Ltd., of Rugby, have produced a special plug with a small diameter thread (12 mm.), known as the A-50. This plug has in a D.H. Gipsy engine, another standard Bluebird power-unit, passed the 100-hrs. observed type test without any attention. This affords a convincing demonstration that the design and construction of the A-50 are as good as they can be.

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Specialists in

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FOR ALL PURPOSES.

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FORGINGS, ROUGH OR FINISHED MACHINED,

including Crankshafts, Camshafts, Connecting Rods, Valves, etc.,

to

A.I.D., B.E.S.A. AND ALL OTHER EXACTING SPECIFICATIONS,

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THE BLACKBURN AEROPLANE & MOTOR CO.

and

THE CIRRUS AERO ENGINES, LTD.

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More than 150 years' experience in the production of High Grade Steels. Makers of Alloy Steels, Carbon Steels, High Speed Steels, Stainless Steels, Special Steel Castings, Marine, Aeroplane and Automobile Forgings of every description, including Crankshafts and all Finished Machined parts, Cold Rolled Strip, Magnets, etc.

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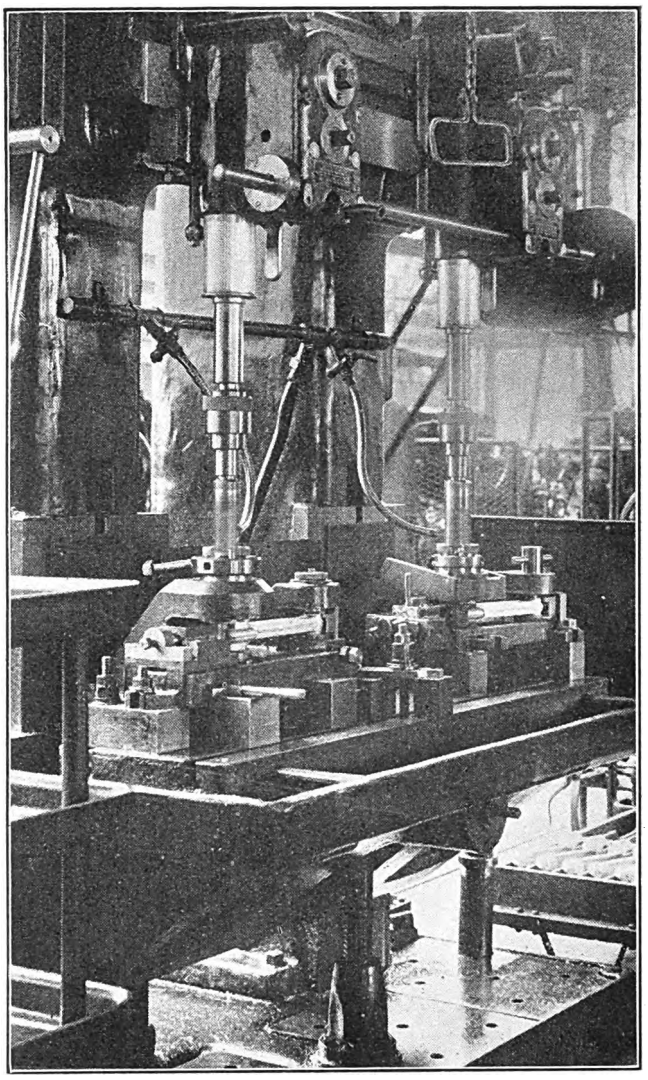


A DRILLING RIG.—A special two-spindle drilling machine working on connecting-rods for the Gipsy engine.

MIDLAND MOTOR CYLINDERS.

The development of the aero-engine has gone on apace in the past few years, but there are still problems to be solved and new applications of old and new theories to explore. The Midland Motor Cylinder Co. Ltd. takes from the shoulders of both the experimenter and the production-model manufacturer the exacting work of dealing with aluminium and its alloys. This company specialises in castings for internal combustion engines and is prepared to fill the specifications of engine builders for any type.

Among the well-known engines in which Midland cylinder castings are used are the Cirrus and Hermes.

THE MONARCH ENGINEERING COMPANY.

The Monarch Engineering Company Ltd., Empire Works, Croydon Road, Penge, S.E.20, are well known for the aeronautical equipment which they manufacture. They specialise in the production of armament equipment, bomb-carriers, controls, release gear, bombs and the like.

They have made a variety of parts for the Blackburn Bluebird, these include fork-ends, spar stiffeners, sockets, tube supports, locating brackets, and a variety of similar fittings. This selection clearly demonstrates the ability of the firm to cope with all classes of work, whether in the machine shop or on the fitter's bench.

PALMER WHEELS AND TYRES.

The wheels and tyres which are supplied by the Palmer Tyre Ltd. for the Blackburn Bluebird have the dimensions 600 x 100. This is but one of the very wide range of sizes, from 300 x 60 to 2,000 x 450, in which wheels and tyres are manufactured by the Palmer Company. And to every wheel in this extensive range Palmer Aircraft Brakes can be fitted.

There is a growing tendency to equip all aircraft with wheel-brakes, which make landings and take-offs over unfamiliar ground considerably safer and more certain. They also make the handling of a machine on the ground very much easier. There is therefore a rapidly increasing demand for an efficient wheel-brake and although the Palmer Aircraft Brake has only been on the market a short time, there is already a demand all over the World for these brakes, whose efficiency has been proved in actual practice. In fact one has been told that the Palmer Company has some difficulty in keeping pace with the ever-increasing flow of orders.

The Palmer Aircraft Brake is of the fluid pressure type. An annular expansion chamber is placed between the fixed drum and the brake rim attached to the wheel. A complete ring of brake blocks is forced into frictional contact with the brake rim, when the annular chamber is expanded.

Oil is the fluid used in the system intended for light aircraft. The necessary pressure is obtained from pedals on the rudder-bar. The operation of these forces oil from a container into the annular chamber which is thereby expanded. The use of individual pedals assures differential control for steering when on the ground. As soon as the pedals are released the oil flows back to the container.

Palmer wheel-brakes have the advantage that equal pressure is supplied all the way round the drum, and the further advantage that the brake-blocks are easily renewable by lifting out the expansion unit and replacing it with a new one.

One of the latest applications of this excellent device is to the Cutty Sark Amphibian which has recently been supplied by Saunders-Roe to Mr. Guiness. This application will certainly prove a severe test of the brake as it is being operated under difficult conditions and will frequently be immersed in salt water.

The Palmer Tyre Ltd. have prepared an interesting booklet about their wheel-brakes for aircraft and will be glad to send it to anybody who will write and ask for it.

PETROFLEX AND THE BLUEBIRD.

Like many good aircraft the Blackburn Bluebird uses Petro-Flex Tubing for its fuel lines. The War 1914-18 created an urgent demand for a flexible hose which would be strong enough to withstand the worst conditions of vibration and would remain permanently impervious to the action of petrol, benzol, and the whole range of hydro-carbon oils.

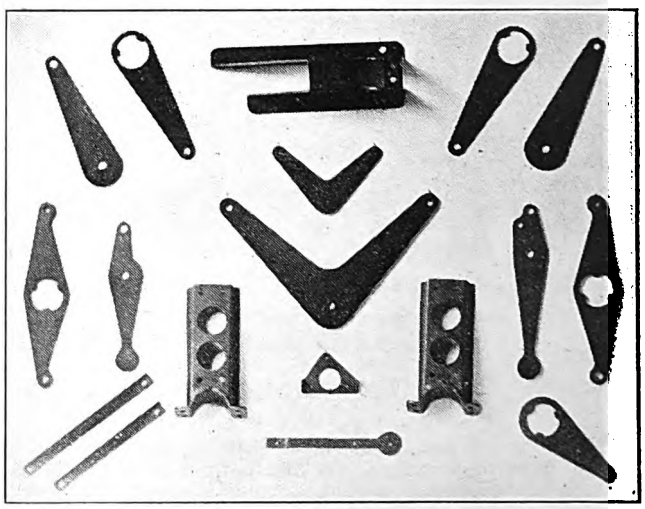
This has been achieved, and Hobdell, Way and Co., Ltd. are marketing Petro-Flex tubing. It has been approved by the Air Ministry and successfully meets all the conditions.

There are three essential features of Petro-Flex tubing the first is a lining of numerous layers of spirit-proof material, the second is a special protective covering of canvas, and the third an internal and external armouring of helically-wound wire.

The internal lining is made from a naturally indestructible product which is specially treated to resist the action of spirit and oils, in this is embedded the internal wire armouring. Thus there is a reasonably smooth bore which cuts down frictional resistance. Then comes the outer wall of treated canvas round which is wound helically the outer coil of wire. This wire forms a protective armour and eliminates the possibility of damage through rough usage.

THE PYNE MANUFACTURING COMPANY.

The Pyne Manufacturing Company Ltd., of Teddington, Middlesex, specialise in the manufacture of electrical apparatus, ignition accessories and spares. A department of their works is devoted to the manufacture of stampings for the construction of aircraft. This department also does



SHEET METAL WORK.—The brackets, levers and other parts for the Bluebird made by the Pyne Manufacturing Company.

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small jobs in sheet metal work and has produced quite a number of parts for the Blackburn Bluebird, such as levers for the altitude and throttle controls, levers for the tail-adjusting gear mechanism and various brackets.

All these parts for the Bluebird have been made of special steel or duralumin which has naturally to pass the A.I.D. specifications and tests in the raw material state. During the manufacturing processes these parts were checked with gauges and a bending test was made on a percentage of them. The parts were next inspected and passed by the approved inspection department of the Pyne Manufacturing Co. Ltd. A further inspection was made by the manufacturer of the machine so that all together these parts have been pretty well scrutinised.

A very wide range of electrical equipment is made by this firm, who produce, among other things, too many for enumeration, Voltage Control Boxes, Dimmer Switches, Plugs and Sockets, Switches, Transmitting Keys, Terminal Blocks, Resistances, Fittings for aero-engine gas starters, various A.G.S. parts, and a range of ignition accessories.

THE PYRENE COMPANY.

The latest improved model of the Pyrene Fire Extinguisher for use in aircraft will project a powerful continuous jet of fire-fighting fluid in any required direction. The extinguisher will work at any angle and any side up. The special fluid which is used remains effective indefinitely, and it will not freeze. This fluid contains neither acid, alkali salts nor moisture.

The Pyrene Company Ltd. also make a range of equipment for protection against fires in hangars and petrol and oil stores. The Phomene Fire Extinguisher, which is of the Foam type, is specially recommended for this work and can be bought in a variety of sizes from two gallons upwards.

RANDALL AND SON.

J. H. Randall and Son Ltd. of Paddington have a reputation as sheet-metal workers, tinners and coppersmiths. This firm has supplied fuel tanks to Saunders-Roe Ltd. for the Bluebird, which shows that they are well equipped to produce components for aircraft.

REYNOLDS TUBING.

Since 1897 the Reynolds Tube Company, Ltd., has been making and improving steel tubing, and with the inescapable development of metal construction for aircraft the company has done valuable work on methods of heat-treating, hardening and drawing tubes, especially in the larger sizes.

Reynolds tubes were well and favourably known when their chief use was in the manufacture of bicycles, but the percentage of the firm's output used for aircraft work took a sudden rise in 1928 from five to about 40 per cent.! This indicates not only a new status for the Aircraft Industry, but a new place within it for steel construction. The removal of the Air Ministry's ban on welded construction also reacted in favour of tubing.

Reynolds steel tubing is used extensively in the light aeroplane business, and gives good service, among other places, in Cirrus engines, where it forms the hollow pins for certain moving parts and is used for control-rods and shafts where lightness and strength are essential.

The company's plant is modern in the extreme, and besides manufacturing products of the finest grade it produces them to the special requirements of the Aircraft Trade by means of the long and thorough experimentation in which the firm has specialised. The exacting specification for steel tubes to go into the Government Airship, R.101, in sizes never before attempted to such exactitude, were met successfully, and large quantities were supplied to Boulton and Paul Ltd. for that ship.

RUBERY OWEN AND COMPANY.

Rubery Owen and Company were the first firm in their own particular category to see the possibilities of the aircraft business, and from the earliest days of flying the firm laid itself out to supply the needs of this market.

The firm are on the approved list of the Air Ministry and are large manufacturers of aeroplane components. They produce vast quantities of A.G.S. parts, such as Bolts, Nuts, Turnbuckles, Eyebolts, Shackles, Shackle-pins, Washers, Studs, Thimbles, Fork-ends and such like in high-tensile steel, in Staybrite, in duralumin and mild steel. All the normal steel parts can be supplied Cadmium-coated if required,—a form of protection that is becoming very popular.

Rubery Owen and Co. have had their components used on all the prominent British post-war flights, such as the Australia-England flight of Sir Alan Cobham, Mr. Bert Hinkler's flight to Australia, the England-India non-stop flight of the Fairey Long Range Monoplane, and so on.

SHELL.

The name Shell is more than a household word wherever aeroplanes fly, because the qualities of fuel and lubricants bearing this name have made them as popular in the flying world as they are in automotive circles on the ground. The uniformly good quality of Shell petrol and Golden Shell oil is equalled only by the service given by its purveyors, Shell Mex Ltd., who have a remarkable record for supplying these necessities in places which are hardly to be got at by other than aerial routes.

THOMAS SINTON AND COMPANY.

Thomas Sinton and Company Ltd. of Laurel Vale, Tanderagee, Ireland, are well-known as manufacturers of aeroplane fabric, tapes and similar material for the Aircraft Industry. They have supplied goods of this kind to Saunders-Roe Ltd. for the covering of the Bluebird

They manufacture a special fabric for the covering of light aircraft. This is known as Sintona glider fabric. This cloth is lighter than 4.F.1. and does not come under any B.E.S.A. specification. But the firm guarantee and test every piece, and a Sinton guarantee is as good as anyone can want. This cloth has a breaking strength of 95 lbs. to the inch.

STEVENSON AND SON.

One of the firms who supply Saunders-Roe Ltd. with aeroplane fabrics is Stevenson and Son Ltd., who are well-known linen manufacturers of Dungannon, Co. Tyrone. This firm are well-equipped to meet the requirements of aircraft manufacturers and will be pleased to quote to any specific enquiries. Dungannon has made Irish history, which means influencing English history vitally, in years gone by. And Dungannon looks like influencing the history of British Aviation in the future. From personal experience one can vouch for the fact that Stevenson and Son are the quickest people in their line of business to seize on a business opportunity, and are ready and willing to meet the requirements of any customer anywhere in the World.

TITANINE-EMAILLITE.

The distinctive Blue and Silver finish which was adopted by The Blackburn Aeroplane and Motor Co. Ltd. when the Bluebird was introduced made a special doping scheme necessary. This was prepared and supplied by Titanine-Emaillite Ltd., whose Titanine Dopes and Finishes have for many years been employed by the Blackburn Company, to whom they have given every satisfaction.

An outstanding quality of Titanine dope is its constant tautness under all climatic conditions. This feature appeals not only to the professional pilot, but to the private owner who desires all-weather service from his machine.

One of the interesting things to be seen at the Olympia Aero Show was the frame of doped canvas which was immersed in a glass tank on the Titanine-Emaillite Stand. This frame had been doped with Titanine and in spite of its very lengthy immersion retained all its original tautness.

A complete catalogue of the successes which have been achieved with machines which have been doped with Titanine would take long to read. Among those which have been achieved with light aeroplanes are the African Flights of Sq. Ldr. Slatter, of Mr. Bentley and Lady Bailey, and Mr. Bert Hinkler's record flight to Australia. The D.H. Moth of Miss Johnson is also doped with Titanine.

Titanine-Emaillite Ltd. fully appreciate the desire of private owners to have their aircraft finished in distinctive and attractive colours. They are always pleased to submit a variety and combination of shades which have been proved to meet the high standard of durability of the normal Titanine doping materials. So any one who wants an outstanding colour-scheme should write to the firm and indicate the sort of thing he wants. He will receive every help and advice.

TRIPLEX SAFETY GLASS.

One of the features of the Bluebird is its big wind-screen, which gives ample protection to the occupants of the machine. This windscreen is fitted with Triplex Safety Glass, whose non-splinterable qualities have been widely known ever since the War 1914-18, when vast quantities where used in aircraft.

The Triplex Safety Glass Co. Ltd. began to produce safety glass in quantities in 1912. Since that date the output and quality have been steadily improved. A new factory has recently been built at King's Norton, where some 1,500 people are busily engaged in keeping level with the demand for this material. Though many rivals have appeared on the market of late with much flourishing of trumpets, Triplex still increases its popularity.

The making of Triplex is quite a lengthy business and the first essential is cleanliness, which is easy to obtain at King's Norton. The factory is in open country and has been especially organised for the strict maintenance of cleanliness.

The sheets of glass are first cleaned, then dried, and next coated with gelatine. The coated glass is passed through

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a refrigerating section which hardens the gelatine. All these operations are done on one machine, which is a pretty extensive one.

These sheets are next stacked on special trucks and pushed through a heated tunnel wherein the glass is thoroughly dried. The sheets are then sprayed with special enamel and again dried in a tunnel by which they travel to another department. Here sheets of celluloid are sprayed on both sides with an adhesive in a warm liquid form, and the prepared glass sheets are similiarly sprayed on one side only.

A sandwich is formed by squeegeeing two sheets of glass and one of celluloid together. This sandwich is made into a whole by the application of pressure and heat. After this the edges are ground and a small margin of celluloid removed. The space so left is next filled with a special sealing compound to make the sandwich airtight.

And so the finished product is prepared in whatever shape the customer requires. Pretty tricky the shapes of some aircraft windscreens are too.

THE ULSTER WEAVING COMPANY.

The Ulster Weaving Company Ltd. of Belfast supply Saunders-Roe Ltd. with various materials for the covering of aircraft. Although the firm has big interests in the production of material other than that which is used on aircraft yet they are convinced that it is most essential that flying should be kept in the public eye as much as possible. Especially should this be done not only in the interests of people actually concerned but in the larger interests of the Country and Empire. Britain must not lag behind in a matter which will be of such extreme importance throughout the World in several years' time. Consequently they are anxious to do everything they can to fulfil the needs of the Aircraft Industry.

VACUUM OILS.

Now that mineral oils have been approved by the British Air Ministry for radial engines the world-wide reputation and service of Mobiloil is available to all pilots. Furthermore, the Vacuum Oil Company Ltd. have conducted tests and recommended a special grade of Mobiloil for every make of engine and have made all grades obtainable through their service in any part of the World.

This is a great boon to pilots who wish to start on one of the long-distance flights which are daily becoming more usual for business instead of purely for adventure or notoriety. The user of Mobiloil can set out with the certainty of finding his special grade available to him not very far from any civilised or semi-civilised part which he may visit, and that without extensive preparation or advance notices.

Only recently a French monoplane, fitted with the Genet (Armstrong Siddeley Motors Ltd.) engine, as used with success in the Bluebird, attained a world's record altitude for light aeroplanes of 7,730 m. (25,000 ft.), using Mobiloil. The oil maintained constant pressure throughout the drastic variations of temperature. Lindbergh made his famous trans-Atlantic flight on this oil. It is recommended by the makers for Bristol, Cirrus, Gipsy, Genet, Hermes, Jaguar, Leopard, Lynx, Mongoose, and all Salmson engines.

VICKERS AIRCRAFT ACCESSORIES.

The accessories supplied for aircraft by Vickers (Aviation) Ltd. are designed and constructed particularly for aircraft, and their merits arise from the long experience of this firm in the theory and practice of flying.

The range made by this firm is astonishingly wide, making their catalogue a valuable work of reference for constructors of aircraft. Among the more famous specialities are Vickers airscrews, Vickers oleo-pneumatic shock-absorbers, the Vickers-Potts oil cooler, Vickers streamline wires, swaged tie rods, etc.

In addition to these are Vickers hydraulic brakes, navigation and cabin lighting systems, pipe-clips, metal couplings, pulleys, and Vickers-Reid control indicator and accessories for fuel systems.

Brakes and control indicators are rapidly coming into greater favour now that blind-flying is an essential of successful competition with ground transport. The Vickers-Reid control indicator was used by the Duchess of Bedford and her crew on the *Spider* and is standard on all aircraft operated by Imperial Airways, Ltd.

WELLWORTHY LTD.

Cirrus Aero Engines Ltd. buy their piston-rings from Wellworthy Ltd. who are world-famous as specialists in this component, which is such an essential part of any internal combustion-engine.

Extreme accuracy is necessary in the manufacture of piston-rings, which are, one supposes, the only existing example of springs of any shape or kind made of cast iron. The extreme accuracy of their products was illustrated by the firm on the stand at the Aero Show at Olympia last year, where by an ingenious optical arrangement, if a ring were a hair's breadth out of truth, the error was made visible by a beam of light.

THE WEYBURN ENGINEERING CO. LTD.

Nowhere more than in aero-engines is machine work of the highest accuracy, and the maintenance of that accuracy under the severest of working conditions essential. Modern steels and modern treatments have enabled engineers to achieve what are almost miracles, and it is in fine but highly-stressed machine work that the Weyburn Engineering Co. Ltd. specialises.

Cam-shafts, which must continue to lift valves an exact distance hundreds of times a second for days on end at all temperatures; valves to resist battering at red heat without warping or pitting; gudgeon-pins, tappets and small parts that must be glass hard and machined to a hair are turned out daily by the Weyburn Engineering Company for the Cirrus engines that go into Bluebirds and other light aircraft.

Besides catering specially to the demand for the more difficult machine-work the Company is equipped to undertake the manufacture of almost all engine parts with the same high level of dependability as that for which Cirrus engines have become proverbial.

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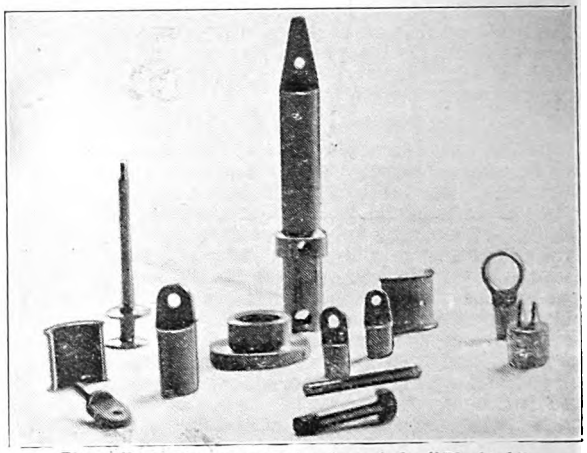
COMPONENTS



These illustrations represent a few of the "Bluebird" parts supplied to Saunders-Roe, Ltd., by Atalanta.

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THE "GRAF ZEPPELIN."

On May 18 in the afternoon the *Graf Zeppelin* left Friedrichshafen on a journey to South and North America. The journey is in five stages: Friedrichshafen-Seville; Seville-Pernambuco; Pernambuco - Rio de Janeiro; Pernambuco-Havana-Lakehurst; Lakehurst-Friedrichshafen.

This trip is of special interest as the Seville-Pernambuco stage will be used as a rehearsal of the projected Luft Hansa route to South America. By this scheme Luft Hansa will fly the mail from Berlin to Barcelona, a Spanish company will fly it from Barcelona to Seville, a Zeppelin will carry it from Seville to Pernambuco, and thence the Kondor Syndicate, which is controlled by German interests, will distribute it.

This is another attempt to solve the problem which has just been successfully attacked by the Aéropostale Company, who fly the mail by heavier-than-air craft all the way from Paris to Santiago-de-Chile.

The airship would appear to be the more certain way of crossing the South Atlantic, seeing that airship voyages across the Atlantic have been 100 per cent. efficient, though the seaplane is considerably faster.

Another interesting feature of the cruise is that it is the first time an airship has attempted to cross the South Atlantic and also that it will be the first time the *Graf Zeppelin* has crossed the Equator.

Further it will be a useful example to those who fear to send the R.100 to India because of the hot weather.

The *Graf Zeppelin* was moored to the specially erected mast at Seville on May 19 in the late afternoon. On the morning of May 20 the ship left for Pernambuco. The first cousin of King Alfonso, the Infante Don Alfonso, of Spain, who is an officer in the Spanish Air Service, is a passenger.

Colonel Don Emilio Herrera, formerly commanding at Cuatro Vientos, who resigned from the Spanish Army some years ago to devote himself to the formation of this Spanish —South American airship line, also travels in the ship. His many friends in aviation all over Europe will rejoice with Colonel Herrera in this accomplishment of his aims and dreams of the years past.

A BIGGER METAL-CLAD AIRSHIP.

A newspaper story from America states that on May 11 the Commandant of Scott Field, Illinois, announced the preparation of plans for the construction at the Field of a metal-clad airship for the Army, to cost $4,500,000 (£900,000).

The new airship would be 547.2 ft. long, with a maximum width of 119.5 ft. It would have a gas volume of 3,758,300 cubic feet and displace 3,806,500 cubic feet of air. The proposed power plant would be eight engines, with a total of 4,800-horse power, to develop a maximum speed of 100 miles an hour. The airship would weigh 151,400 lbs. (about 67½ tons) and its useful load be more than 200,000 lb. (nearly 90 tons).

The airship would be equipped with 30,000 rounds of ammunition, one 37-millimetre gun, from two to seven tons of bombs, two aeroplanes, 10 machine-guns, and a 1,000-watt searchlight.

Some British newspapers referred to this as an "armoured" airship and invented weird stories of this new engine of war. The first is that it merely refers to a bigger and better version of the metal-clad ship which has been built to the designs of Mr. Ralph Upson of the Aircraft Development Corporation. In this type the metal skin acts at once as the gas-container and as the bracing for the former-rings on which the shape of the ship is built.

THE UPKEEP OF R.101.

In the House of Commons on May 14, in reply to a question by Mr. White, the Under-Secretary of State for Air said that the expenditure, including overhead charges on airship R.101 from the date she left her shed for flight trials up to March 31, 1930, had been approximately £34,000, of which £21,000 had been in respect of modifications for the purpose of improving the airship's performance.

WHAT A YOUNG AVIATOR OUGHT TO KNOW.

[*How to Become an Air Pilot.* By R. L. Preston. 88 pages, 7½ in. x 5 in. Sampson Low, Marston and Co. Ltd. Supplied by THE AEROPLANE Book Department, Cannon House, Pilgrim St., E.C.4. 3s. 8d. post free.]

This is a volume containing more than the title implies, and in some ways less than the average purchaser will, not quite logically, expect it to tell him. Quite properly the technical business of learning to fly is left to the instructors who make a business of it, and the author of the book covers this part of it in his first chapter on General Information by showing the means for discovering one's aptitude, or otherwise, for flying, the length of time usually required to learn, the approximate cost and a very complete list of clubs and schools where instruction may be got. The aspiring pilot has the sources very well pointed out to him, but there is no attempt to teach him to fly as Tybalt fought, "by the book of arithmetic."

The second chapter devotes itself to the Royal Aero Club Certificate and Air Ministry "A" licence, and explains clearly the qualifications required for both and the privileges conferred by their possession. The next chapter, on The Technical Examination, is in the form of question and answer, and deals entirely with Rules for Air Traffic, International Air Legislation, and all the regulations which are so terrifying in the mass to an applicant.

Information for the private owner includes useful tips on the purchase of an aircraft and some sensible remarks on air insurance. Certificates of Airworthiness are explained, and the formalities made clear, with the correct procedure for obtaining them. Carnets and other necessities for air travel abroad are also dealt with, and the final chapter on Notices to Airmen includes a list of air navigation regulations, some information on *The Air Pilot,* Customs, log books and flying heights when crossing the English Channel.—F. D. B.

A BOOK FOR BEGINNERS.

The Broad Skyway, a non-technical handbook for the guidance and information of people who are just beginning to take an interest in flying, by Michael Steuart, will be published next week by Aeronautics Ltd. at 2s. 6d. net.

This book is not only a source of information for those who are just becoming "air-minded," but it is a book which those who already know all about aviation will find very helpful, for by giving or recommending it to those whose interest in flying takes the form of perpetual questions, they will save themselves much trouble. It tells the questioner just why, where and how he or she can learn to fly.

The Broad Skyway will be on sale at THE AEROPLANE Book Dept., Cannon House, Pilgrim Street, E.C.4, 2s. 6d. post free.

A BOOK ON GLIDING.

Gliding and Soaring Flight, by J. Bernard Weiss, with a preface by C. G. Grey, Editor of THE AEROPLANE. This book was originally published in 1922 and is still the only book in English which deals adequately with the history of gliding. It does not profess to teach gliding nor does it describe how a glider is made. Copies may be had from THE AEROPLANE Book Department, Cannon House, Pilgrim Street, E.C.4, at 5s. 6d. post free.

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THE PATRON SAINT OF BRITISH AVIATION.

On May 15 a Banquet in honour of the Rt. Hon. the Lord Wakefield of Hythe, C.B.E., LL.D., was given by the Royal Aeronautical Society, the Royal Aero Club, the Air League of the British Empire and the Society of British Aircraft Constructors at the Savoy Hotel. His Grace the Duke of Atholl, K.T., G.C.V.O., D.S.O., President of the Royal Aero Club, was in the Chair and the assembled company included a distinguished and representative gathering of those concerned with British Aviation.

After the Loyal Toasts had been honoured the Chairman read telegrams of greeting and appreciation of Lord Wakefield from the Johannesburg Light Plane Club, the Aero Club of East Africa, the New South Wales Aero Club, the Auckland Aero Club, and the Marlborough Aero Club, New Zealand, the Aero Club of India and Burma, the Singapore Flying Club, the Aviation League of Canada, and the Toronto Flying Club, all of whom have received gifts of light aeroplanes from Lord Wakefield.

THE DUKE OF ATHOLL, proposing the health of The Guest, said that it was a most difficult toast to propose because it was impossible to express what everyone would wish him to express. They had met to do honour to one in the world of aviation who deserved all the honour it was possible to do him. Lord Wakefield had made Aviation his own child. Every Flying Club in the country had been helped by him. He had given scholarships to the Royal Air Force of great value, intrinsically as well as otherwise. He had helped the Royal Aeronautical Society and he had subscribed generously to the Royal Aero Club's Racing Fund and to the Schneider Trophy Fund. In fact there was nothing in connection with Aviation that he had not supported.

As a successful business man he might easily have rested on his oars on the stormy seas of this life by the application of the products of his own labours,—but his services to his country and to his fellow men had been his first and best duty.

Reviewing Lord Wakefield's valuable public work in the past the Duke of Atholl said that he had been a member of the Corporation of the City of London since 1904. He had been knighted in 1908; and in 1916, the most trying of the War years, he had been Lord Mayor of London. No one had given more assistance to the various War funds. He had been associated with raising over a quarter of a million pounds for Lord Kitchener's Fund, and he had turned the Mansion House into a Recruiting Station. His poster to the Men of London Town had been famous. He had done the most valuable work in increasing the good relationship between the Capital of the Empire and the Dominions.

If everyone was as good a citizen as Lord Wakefield there would be no troubles in the country. Hospitals and such institutions had no better friend than he. In the industrial world his visit to Sheffield in 1920 had resulted in an appeal for a five-years' truce in industry. Everyone had read his splendid book on Leaving School and the Choice of a Profession.

To those who flew he was a fairy godfather. He had not gone through life merely distributing money, he had taught people how to make money and how to give value for value. In his youth he had been a keen footballer and a fine boxer and runner.

His Majesty the King had recently recognised his services by elevating him to the Peerage, a distinction which had come as a pleasure but not as a surprise to anyone. The speaker could simply have got up and given the toast of Lord Wakefield, but that would not have been forgiven by anyone but Lord Wakefield himself. Before proposing the Toast he was going to ask two other speakers to support it, and he was going to ask Sir Philip Sassoon to present Lord Wakefield with a clock, not that Lord Wakefield required any keeping up to time but as a record of the happy hours he had had with them.

AIR VICE-MARSHAL SIR SEFTON BRANCKER, K.C.B., A.F.C. (DIRECTOR OF CIVIL AVIATION), supporting the Toast, said that Lord Wakefield had served the Nation so well that although he was a rabid Conservative the present Socialist Government had arranged that he should be given a Peerage, which showed that he had got that honour untarnished by politics. After a somewhat complicated reference to Flying Clubs and statistics, in which the word "statistics" was used so frequently that it almost constituted a challenge, Sir Sefton Brancker made a mild onslaught on the Press (his strongest supporters) and referred to the similarity between an article in *The Times* of 1842 denouncing the reckless courage of Queen Victoria in making journeys by railway and a recent issue of another paper appealing to the Prince of Wales to refrain from flying to London from Marseilles.

He said that Sir Charles Wakefield, our Guest, had been called the Patron Saint of British Aviation. In trying to find an adequate description of him since his elevation to the Peerage he had found the Christian hierarchy unable to deal with the proposition and had turned to Budhism. Here he had read of the Bodhisat, who was all giving and all forgiving and a friend who never failed.

In doing honour to Lord Wakefield they did not forget Lady Wakefield. Lady Wakefield was a dark horse and people often wondered whether she encouraged Lord Wakefield to save up to help the light aeroplane clubs or whether she really disapproved of them.

The latest news of Miss Johnson was that she was held up at Rangoon by the weather, but Miss Johnson had a way of defeating the meteorologists. Sir Sefton claimed to be responsible for Miss Johnson's flight as he had lured Lord Wakefield into backing her. This was only one of the many Imperial flights that Lord Wakefield had supported, in fact Lord Wakefield was becoming a danger to traffic. He was also a supporter of gliding. The gliding experts thought they would soon be able to fly to London from Edinburgh without an engine, which possibility held the prospect of a regular invasion of England by Scotsmen.

COLONEL THE MASTER OF SEMPILL, A.F.C. (PRESIDENT OF THE ROYAL AERONAUTICAL SOCIETY), said that he stood there the advanced guard of the Scottish invasion. Speaking as President of the Royal Aeronautical Society, he found that the task of supporting the Toast of Lord Wakefield was utterly beyond him. This was the first time in history that those assembled in that room were there except as Guests of Lord Wakefield. Colonel Sempill then read a telegram from H.R.H. the Duke of York as follows:—

"I cordially associate myself with the tribute which is being paid by the Royal Aeronautical Society and other aeronautical societies to Lord Wakefield for his outstanding services to British aviation. They are of national and Imperial value."

Lord Wakefield had started and helped to swell the Royal Aeronautical Society's Endowment Fund,—which, he added, was permanently open. He had helped the Society's latest member, Miss Johnson. He had intimated that he was about to make another gift to the Society which would take the form of a suitable badge of office for the President of the Society to take the place of the piffling little bauble the speaker was at present wearing.

He said that Lord Wakefield had been singularly fortunate in the life-long companionship of a very charming lady. Lady Wakefield had taken a real share in her husband's work, particularly his work for the young and the sick. She had been practically a Deputy Lord Mayor during the trying year of Lord Wakefield's office.

Lord Wakefield was a realist who faced facts with cheerfulness. In the world of flying he had made our paths smoother, not so much by gifts as by his dominant personality.

SQUADRON LEADER THE RT. HON. SIR PHILIP SASSOON, BART., G.B.E., C.M.G., M.P., said that he had been asked not to make a speech. Lord Wakefield was the Chairman of the Conservative Association in Sir Philip's constituency and had therefore heard a good many of the speaker's effusions,—none of which was exaggerated. He would content himself with reading the inscription on the clock which he had the pleasure of presenting to Lord Wakefield on behalf of the four Aeronautical Societies represented at the Dinner. The inscription read:—

"This is presented to Lord Wakefield by the Royal Aeronautical Society, the Royal Aero Club, the Air League of the British Empire and the Society of British Aircraft Constructors as a token of grateful regard and esteem."

THE RT. HON. THE LORD WAKEFIELD OF HYTHE, C.B.E., LL.D., replying, said that words were inadequate to express the feelings of one's heart. He spoke of his appreciation of the telegram from H.R.H. the Duke of York, and said that the speakers had magnified his own virtues. This tribute to him would be a fragrant memory for all time.

He appreciated very much the presence of the Duke of Atholl in the Chair. His Grace had come at great inconvenience to himself. In Edinburgh last week he (Lord Wakefield) had presided at and had addressed a meeting of Scottish shareholders for the first time. He had been able to tell them of an increased dividend.—a statement which had been received almost with enthusiasm. Tonight, those who were entertaining him had paid him handsome, golden dividends in thought and appreciation for many years to come.

Practically everything he had done in life was due to his wife. She had been the inspiring influence which had made for his success. He had particularly appreciated the gay wisdom of Sir Sefton Brancker—his genial Mussolini. Sir Sefton would often come into his office and argue with him and always succeed. The Master of Sempill was a young man whose greatest asset was his charming personality. He also succeeded in his methods. Sir Philip Sassoon resented praise so he had to give it to him in homœopathic doses, but he was one of the most generous-minded men in public life. It was a fine thing to be broad-minded as well as generous-minded. Their friendship was one of the joys of his life.

This party was really his aviation coming-of-age. In 1909 he had first begun to interest himself in the fascinating quest for air mastery. He made no claim to be a prophet but had always been a sympathetic onlooker. In March 1910 he had made a public profession of his faith in the future of aviation.

He was proud of the achievements of English women in the air. Miss Amy Johnson was well on her way to realise her great ambition and all our thoughts went out to her in her great enterprise. That fine sportsman, Bert Hinkler, had expressed the hope that she would be successful. On behalf of his wife and himself he thanked the assembled company for their kindness which they would remember all their lives.

MR. F. HANDLEY PAGE, C.B.E. (CHAIRMAN OF THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS), proposing the toast of The Chairman, said that this was one of the happiest family parties ever gathered together in the history of British Aviation. Nothing we could say was too good for Lord Wakefield. He was the greatest possible inspiration as a leader of any team.

The Chairman had a long and distinguished connection with aviation. In the very early days he had formed the Blair Atholl Syndicate and had interested himself in the Dunne safety aeroplane. He had been Chairman of the Royal Aero Club from 1913 to 1920 and was still interested in and keen on Aviation. During the War he had had the more arduous duties of Lord Chamberlain which included making the theatre fit for the R.A.F. to go into.

Many people had suggested that he (Mr. Handley Page) should go

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into Parliament, but nobody had ever suggested that he should stay in Aviation. He had three small daughters and the future menace of Gretna Green vanished when he saw what Miss Amy Johnson had done. He saw himself having to fly, perhaps on an unslotted machine, all the way to Australia to forbid the banns.

HIS GRACE THE DUKE OF ATHOLL, K.T., G.C.V.O., D.S.O., said that Scotsmen tried to be cheerful but found it difficult to be humorous. The menace of an unproductive glide from Scotland to England was nothing to the avalanche of motor charsabancs from England into Scotland. Mr. Handley Page's aeroplane had been called the Ark of Civilisation but the speaker always remembered Mr. Handley Page's bombing machines and got a certain amount of comfort from the fact that Mr. Handley Page belonged to this country and not to another.

Apparently he was modest in giving information to people who write books, because when he looked him up in a reference-book under Handley-Page he had found "see plain Page," and then most of the information was in French describing various foreign honours. Following the information that he had been born and was married, were the words "*three d's.*" In Army records the letter "d" meant charged with drunkennes but not proved. He discovered however that it meant in this case three daughters.—C. M. MCA.

AN APPRECIATION OF A GREAT FLIGHT.

On May 14, the Shell-Mex Company gave a lunch at the Savoy in honour of her Grace the Duchess of Bedford, Captain C. D. Barnard and Mr. Robert Little, on the accomplishment of their flight to South Africa and back.

Mr. Samuel Samuel, Director of the Shell Organisation, said, in proposing the health of the Duchess of Bedford, that he did not propose to make a long speech because certain gentlemen at the other end of the Embankment had kept him up till past five that same morning making speeches. The subject of their discourse was Mental Deficiency. Needless to say the Government had a very large majority.

Referring to the Cape-and-back flight he said that it had been of great benefit to British aviation. By kind permission of Her Grace, the monoplane *Spider* which had been used by the Duchess had been exhibited for several days on the island site at Aldwych through the courtesy of the proprietors of Bush House. There had been an enormous number of visitors and they had, on the whole, shown well-informed interest. [As a matter of fact, over a hundred thousand people visited the machine during the few days it was at Aldwych and it is now going to Liverpool and Edinburgh for a similar show.—ED.]

If the Exhibition had been so well worth while, said Mr. Samuel, how much more had the flight itself been worth while for the sake of the wonderful impetus it had given to the thoughts of the whole Empire. It had thrown a light of estimable benefit on the whole problem of Empire transport. He was glad that the Shell Company had been able to co-operate in such a great feat. And in his congratulation to the crew he joined Mr. Roy Fedden, of the Bristol Company, whose Jupiter engine had enabled them to achieve the apparently impossible.

SHELL! SAID THE DUCHESS.

Her Grace the Duchess of Bedford, replying, said that she welcomed the opportunity of expressing her thanks, and her appreciation of the way in which the Shell Company had contributed to the success of their flight. She said that she was not competent to discuss the quality of Shell petrol and oil, but it carried them safely throughout their journey. From her point of view the great thing about it was that it was always ready wherever they arrived.

Having supplies ready in this way by sheer good organisation meant that there was no delay in filling up the machine and no curtailment of the short period of rest allowed to their engineer. Whenever they stopped for the night there was always anything between four and six hours' work to be done in inspecting all the various parts of the machine and making small adjustments and filling up the tanks.

The representatives of the Shell Company were always there when they arrived. They were always helpful and on most occasions they supplied the ground transport from the aerodrome to the place where they were to rest for the night. Her Grace said that the Shell Company needed no advertisement from her, but a tribute to courtesy was never superfluous, and she wished to pay such tribute.

LUCK AND JUDGMENT.

AIR VICE-MARSHAL SIR SEFTON BRANCKER, Director of Civil Aviation, proposing th health of the rest of the crew, said that he sympathised with Mr. Samuel Samuel in being kept up so late, sometimes the seething life of London even kept him up till after five in the morning. Referring to the Cape and back flight, he said that the Duchess of Bedford had supplied just what was needed in the way of a stimulus to British aviation. Capt. Barnard was an able pilot, but there were other able pilots also. The great thing about Captain Barnard was that he possessed the quality of luck as well as ability.

He himself, Sir Sefton, had had an example of that, when a good many years ago he flew to Prague with Captain Barnard. They landed in a field near Prague in very bad visibility and just pulled up in time before running into a hut on the field. People came running out and told them that in alighting they had missed a high-tension cable by a foot or two and the hut into which they had almost charged was full of high explosives.

Referring to Mr. Little, Sir Sefton said that he belonged to that gallant fraternity of ground engineers, so called probably because they spend most of their time in the air. Mr. Little was also a competent pilot and navigator.

The thing that he, Sir Sefton, liked best about the whole flight was that his Department had no appeal from the Duchess for a subsidy. We are all very proud of the Duchess and her crew, and he hoped that the industrious *Spider* would continue to spin its web all over the British Empire.

THE HEROES OF THE DAY.

CAPT. C. D. BARNARD, replying, said that the Shell Organisation was what had made the flight possible. Also they had been immensely helped by the Air Ministry in making this flight to the Cape in ten days with only ten landings. He reminded his hearers that a South African aviator, Mr. Murdoch, had done the same journey in 15 days in a Moth, and that people in this country were very apt to forget that particularly good flight.

He said that all through Africa and back they kept on finding Moths in most out-of-the-way places, which only showed the good work which that machine was doing in teaching people to fly.

He said that owing to reports of flooded aerodromes all over Central Africa, they had been compelled to alter their course to Dodoma, and were only able to give a day's warning to the Shell Organisation. In spite of that, the Shell representative, with adequate supplies as usual, was ready waiting for them when they arrived at the end of that day's journey.

He told quite a good story of how, as they were approaching Cairo he saw some pyramids ahead of them. He passed a note back to Mr. Little asking which they were. Mr. Little, who, incidentally, had been considerably puzzled in the Southern part of their journey by the appearance of railway lines which had been built since their maps were produced, passed a note forward saying that he only had an old map, and probably the Pyramids were not marked on it.

In conclusion, Capt. Barnard said that throughout the flight they had had the very greatest help from the Royal Air Force and the South African Air Force and from the Italians and French and Bulgarians. This help had been greatly appreciated and he wished to acknowledge it. Only because of all this help had they been able to beat the London to the Cape and back record by the margin of 121 days.

MR. ROBERT LITTLE, also replying, and said that somebody had referred to him as being gallant, but he had never felt less gallant than at that moment, when he had to make a speech. He said that he fully endorsed everything that had been said about the Shell organisation. He particularly wished to emphasise the excellence of the organisation at Cape Town, where, having arrived tired and thirsty on a Sunday, when prohibition is in full blast, the local Shell Depot enabled them to overcome that difficulty.

MR. C. G. GREY, proposing the health of the Chairman, said that everybody in these days was indebted to the Shell Company in one way or another, if only for the amusement provided by the Shell advertisements. He added that naturally on the subject of advertising he spoke without prejudice.

MR. SAMUEL, replying, said how proud the Shell Organisation was to know that it has been instrumental in establishing one of the greatest benefits of mankind, the internal combustion engine. The motor-car and its engine were not only used for the amusement of the idle people of the world, they were used in all industries all over the world. He assured his hearers that the Shell Company would always endeavour to be in the front of developments.

NEWS OF THE NEW AEROPLANES.

The time is now about ripe for the appearance of the various new aeroplanes which have been abuilding during the Winter. Something has been said about these in THE AEROPLANE from time to time, so a brief review of them seems opportune.

The tandem-engined monoplane amphibian which has been built by Sq. Ldr. H. G. L. Hinkler and Mr. R. H. Bound has already done experimental flights at Hamble.

The low-wing four-seater twin-engined monoplane, known as the Meteor I, with inverted Gipsy engines in the wings, designed by Sir Henry Segrave and built by Saunders-Roe Ltd., is almost finished and should be flying within the next week. One gathers that future all-metal versions of the same machine, several of which are on order, are to be built at Brough by the Blackburn Company.

The twin-engined Vellore which is being built by Vickers Ltd. at Weybridge, may be out any time now. And the three-engined cabin monoplane which is being built by Vickers Ltd. at the Supermarine Works at Southampton, is also expected to be out very shortly.

An interesting monoplane which is being built somewhere down in the South-West very quietly by Mr. N. S. Percival, the well-known Australian aviator, and Mr. B. B. Henderson, late of the Hendy Hobo, is in an advanced stage of completion.

The curious low-wing monoplane which is being built somewhere in the region of Heston under the supervision of Mr. V. H. Baker, the Heston instructor, is also nearing completion. This machine has the engine at the back driving a tractor airscrew through a shaft between the side-by-side seats. The idea is to give a good view forward.

The biplane which is being built by Mr. P. G. Robinson of the Robinson Aircraft Co. Ltd., at Croydon, is also very nearly ready.

By way of contrast in size, work is progressing favourably on the forty-seater Handley Pages at the new aerodrome of Handley Page Ltd., at Colney Street, near Radlett.

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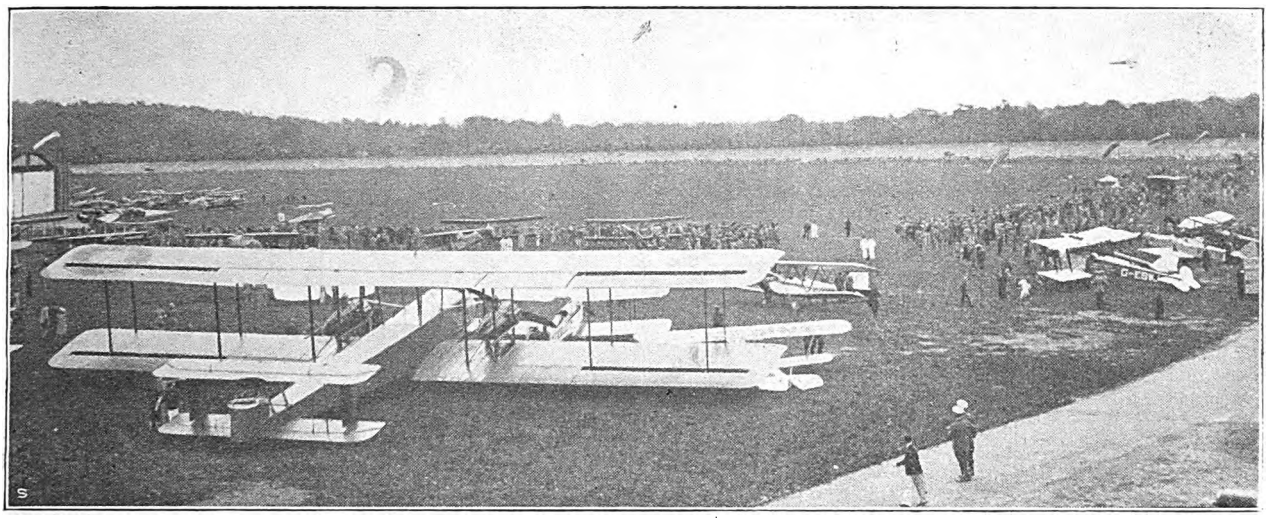
THE LIGHT AEROPLANE
AND THE FLYING CLUBS.



BROOKLANDS REDIVIVUS.—A view from the Byfleet Bridge early in the afternoon.—(*"Aeroplane" photograph.*)

THE BROOKLANDS DISPLAY.

On May 17, by way of giving a good send-off to the Brooklands Aero Club, which has been formed in conjunction by the Brooklands Automobile Racing Club and the Brooklands School of Flying, the most successful air display so far seen this season was held at that historic cradle of British Aviation, the Brooklands Aerodrome. The programme, which was excellent of its kind, went through with a minimum of delays and omissions, and the field control showed distinct signs of care and regard for safety.

The spectators numbered some 10,000, the accommodation was good and the number of aeroplanes which either flew to the field or performed in the display, or both, numbered about 80. Of these 62 were purely goodwill visitors who did not participate in the show, and included Moths, Avians, Bluebirds, Widgeons, Desoutters, a D.H.9 and a Puss-Moth.

To provide an "all-star" programme, in the sense that every turn is a display or a comic interlude without the added interest which comes from open races, is an exceedingly difficult thing.

The managing committee deserve credit for resisting the temptation, if any, to run races in a neighbourhood like Brooklands, where they would be more than usually dangerous. In any case they relied solely on the actual merit of the exhibition flying. The only suggestion which might be made has been voiced before in these columns, that the waiting crowd might be treated to a parade of aircraft close-up. The great diversity of types present at Brooklands last Saturday offered an opportunity that would be difficult to better.

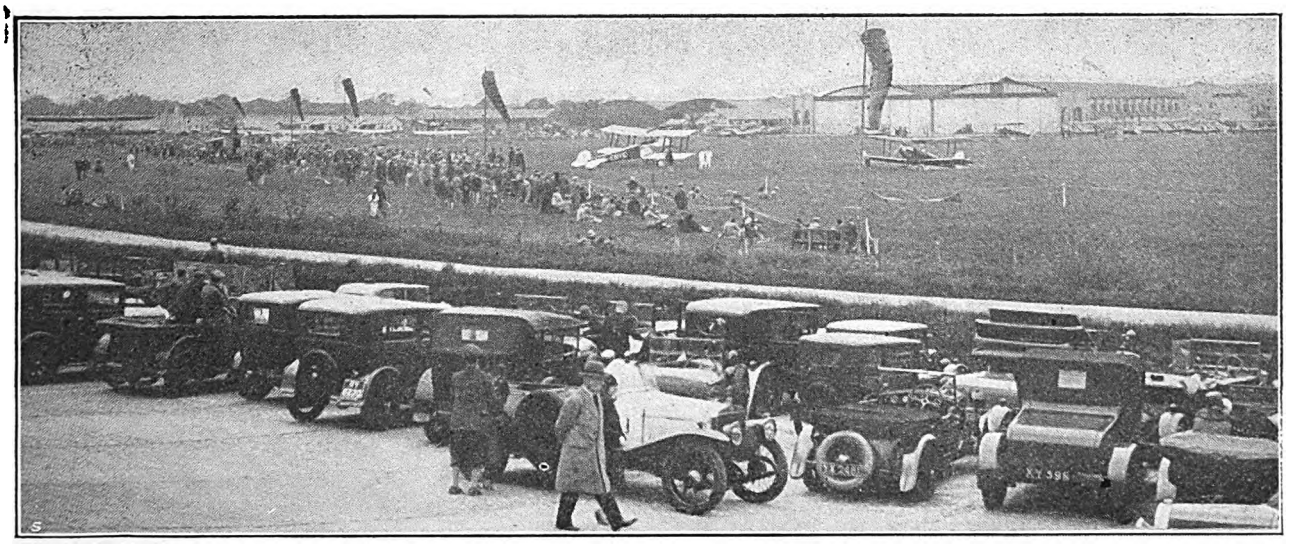
The participating aircraft were lined up in order of their appearance, and each was taxying out in lots of time for the Vérey light which warned his precedessor to bow himself off. That is to say the purpose was obvious, and only once or twice was there delay. A car drove past the enclosures displaying the numbers of the turn, supplementing the loud-speakers which were quite well operated.

Flt. Lt. T. Rose in the Anglo-American Oil Company's Moth (Cirrus III), AAKJ, opened the ball with his usual finished display of aerobatics and was followed by John Rogers, who flew the little blue Klemm (Salmson), D1776, through its paces in a slow-flying demonstration.

Mr. George Murray, a civilian "A" licence pilot trained in the Brooklands School of Flying, acquitted himself well in a school Moth in the usual aerobatics, and some less usual manœuvres such as the inverted spin, inverted falling leaf, and a landing from the half-roll following a bunt.

The wing-walking was done by Mr. "Jock" Anderson from end to end of the lower plane of a Le Rhone-Avro owned by the Brooklands School. The pilot, Lt.-Col. G. L. P. Henderson, had brought the wing-walker over from Croydon in a Jupiter-Junkers which had curly and evil-looking exhaust pipes, and was likened by one visitor to Medusa the Gorgon. Mr. Anderson was invited to the microphone after his display to tell the crowd how it was done. [One gathered that, according to his idea, if Sir Alan Cobham and other famous aviators whose machines are habitually bitten by eagles in the course of their great flights, only knew how to walk wings they would be able to walk out and inspect damage and make it right without having to land.—Apart from that, one holds strongly the opinion that wing-walking as a public spectacle should be prohibited. It serves no purpose whatever, except to appeal to the crowd because it is dangerous.—C. G. G.]

The Comper Swift monoplane (40 h.p. A.B.C. Scorpion), although it was reluctant to start at first, made up for it by its performance in the hands of Mr. L. S. Snaith. Its



BROOKLANDS REDIVIVUS.—A view from the track, at the extreme end of the enclosure.—(*"Aeroplane" photograph.*)

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LA FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE
HAVE GRANTED THE FOLLOWING

WORLD'S RECORDS

GREATEST SPEED OVER
100 KILOMETRES.
FLYING OFFICER H.R.D.WAGHORN,
ON
SUPERMARINE ROLLS-ROYCE S.6.
7TH SEPT.,1929.
330·1 M.P.H. 531·200K.P.H.

FLYING OFFICER R.L.R.ATCHERLEY,
ON
SUPERMARINE
ROLLS-ROYCE S.6.
7TH SEPT. 1929,
331·6 M.P.H.
533·800K.P.H.

SUPERMARINE

WORLD'S
GREATEST
SPEED

SQUADRON LDR.
A.H.ORLEBAR,A.F.C.
ON
SUPERMARINE
ROLLS-ROYCE S.6
12th SEPT.,1929.
357·7 M.P.H. 575·700K.P.H.

A REMARKABLE TRIBUTE TO THE
RELIABILITY OF THE DESIGN AND
CONSTRUCTION OF AIRCRAFT
BUILT BY

THE SUPERMARINE AVIATION WORKS LIMITED
PROPRIETORS:
VICKERS [AVIATION] LIMITED
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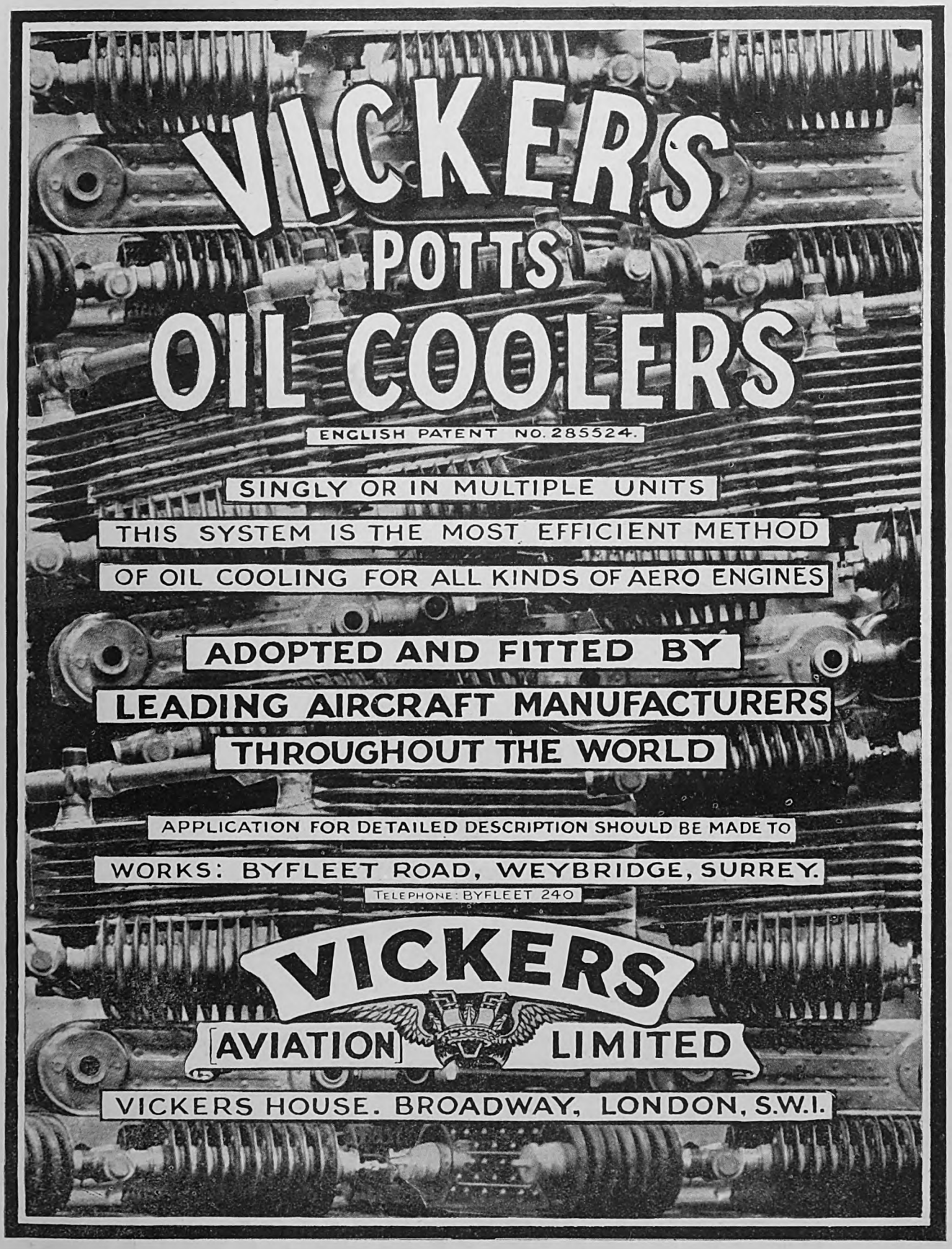

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BRISTOL AIRPORT

3 Miles from Centre of City. 800 yards Landing Area.
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Accommodation for all types of Aircraft, Petrol and Oil Service Station, Flight Tuition, Repair and Maintenance Shops, controlled by a Commercial Company, Restaurant, Show Rooms and Land available for the Erection of Aircraft Factories Assembly Plants, etc.

THE AIRPORT IS CONVENIENTLY SITUATED FOR THE BRISTOL (CITY, AVONMOUTH AND PORTISHEAD) OCEAN DOCKS.

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BRISTOL—THE AIRPORT OF THE WEST.

THE MANUFACTURERS KNOW!

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ARE FITTED AS STANDARD ON

BLACKBURN 'BLUEBIRD' AIRCRAFT

DUNLOP RUBBER COMPANY LIMITED
FORT DUNLOP, BIRMINGHAM.
Branches throughout the World.

C.F.H.255

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COMMERCIAL AERONAUTICS.

THE TOWNEND RING.

The following notice has been received from Boulton and Paul Ltd. of Norwich:—

BOULTON AND PAUL LIMITED announce that they are the holders of all the Foreign and Dominion patents covering the device known as the Townend Ring and that in addition to the original patents they have applications pending both in this country and abroad for certain important improvements on the original device.

IN addition to this they have entered into an arrangement with The Department of Scientific and Industrial Research whereby subject to the right of the Crown to free user of the British and Dominion patents they will issue licences for the use of the Townend Ring to British Aircraft manufacturers for use on aircraft either for sale in this country or for export. Under this arrangement they will give to all such licensees such technical information and assistance as is necessary for the design and installation of rings of this type. Boulton and Paul Limited are also open to consider the granting of licences for the manufacture and use of Townend Rings abroad to any responsible applicants.

EXTENSIVE tests both model and full scale have now proved that, given a satisfactory installation, the Townend Ring is capable of reducing the resistance of a radial air-cooled engine to a figure very much lower than is possible with any ordinary type of cowling. At the same time the ring does not prejudice cooling or interfere with the accessibility to the engine to which it is fitted as do other types of cowling which claim to produce approximately similar reductions in resistance. It must, however, be emphasised that to obtain satisfactory results with the Townend Ring the ring itself must be designed in conjunction with the complete engine and body combination in order to obtain satisfactory results and that the assistance of a firm with expert knowledge of the characteristics of the Townend Ring will prove of great value to all those who propose to use this type of cowling.

REVISING AIR MAIL REGULATIONS.

A move is being made by the Civil Aviation Section of the London Chamber of Commerce to begin a revision of the present complex conditions in air mail regulations.

The Section recommends, among other things, that the clumsy system of surcharges be replaced by a flat rate basis of charges on weight, and that Postal Administrations do not attempt to make more profit out of air-borne mails than they do from the more usual modes of carriage. All countries in the International Postal Union, they suggest, should conform to a uniform basis of charge; air companies should be allowed to forward mails by the fastest alternative route when compelled to delay flights, and distinctive marking, analogous to the blue pencilled cross for registered letters, be adopted instead of labels or special stamps for air mail. A diagonal red pencil cross is suggested.

All these suggestions indicate desirable paths of development if air mail is to become popular; which is almost the same as saying if aviation is to become popular. For one person who believes the air to be a common-sense medium for personal travel there are at least fifty who would trust their letters off the ground. And considering that mail pays considerably better than passengers and is far less critical of accommodation and piloting it seems the ideal pay-load for regular as well as experimental passenger air lines. A readjustment of the present complex and unbalanced situation is the first requirement for stimulating air mail business.—F. D. B.

THE JUNKERS G.38.

The Junkers G.38, which has been illustrated on the front cover of THE AEROPLANE and inside it, has now passed her tests and been accepted for use on Civil air lines. She has been registered as D. 2000.

On May 14 the G.38 went for a flight of 10½ hours round about Germany and was afterwards inspected by the Minister for Communications, Herr von Guerard.

The G.38 which has a total h.p. of 2,400, has all four engines housed within the wing, which means that the engines are available for constant inspection and attention by the mechanics. The airscrews are carried in extensions which are built forward of the leading edge. One believes that a flexible coupling in which oil is used connects the airscrews and the motors.

All the passenger accommodation is also within the wing so that the whole machine is another step nearer the ideal all-wing aeroplane which Professor Junkers patented in 1910.

RE-VICTUALMENT.—Capt. Barnard and Mr. Little and their supplies of "Shell" at Tunis.

LONG RANGE TELEPHONY AT HESTON.

The ½ K.W. Graham Intermediate Air Port Equipment which has been installed at Heston Air-Park was described in THE AEROPLANE for Oct. 30, 1929, and has been referred to and illustrated a good many times since then, so one presumes that people are familiar with this extremely neat and compactly designed outfit. The other Graham apparatus at Heston has also had to bear the blaze of public notice in this paper, that is the G.A.6 light aeroplane equipment which enables the instructor to bellow warnings at the pupil on his or her first and/or subsequent solos.

Quite recently the Air Ministry have been making range tests from Heston to a D.H. Moth with the Graham G.A.6. equipment. The wave-lengths which were used were 764 and 860 metres. The range has been established as being between 80 and 100 miles, at which distance good clear speech is obtained from which one could write down from dictation. This certainly is a remarkable performance when one considers the minuteness of the apparatus and the shortness of the fixed aerials on the D.H. Moth.

BETTER AND BETTER.

The greatest saving of time yet achieved on the trans-Atlantic mail service is alleged to have happened on May 19. On this date the Heinkel seaplane which is regularly catapulted from the deck of the *Bremen*, reached the pier at New York ten hours ahead of the liner.

AIR MAILS BY PARACHUTE.

In the House of Commons on May 14, in reply to a question by Mr. Mander, the Under-Secretary of State for Air said that trials with a special parachute for dropping air mails and with another parachute device which was a modification of that known as the standard supplies dropper, were in progress, but he was not yet in a position to make a statement on the results of these trials. In addition two methods of delivering air mails other than by parachutes or the landing of aircraft were being examined.

A ROUND TABLE CONFERENCE.

On May 15, at the invitation of the French Government, representatives of the Air Ministries of France, Spain and Italy met at Marseilles. The conference is reported to be endeavouring to find a solution of the numerous problems which arise from aerial navigation over the Mediterranean. No rumour has reached THE AEROPLANE that questions of salvage after forced descent were discussed.

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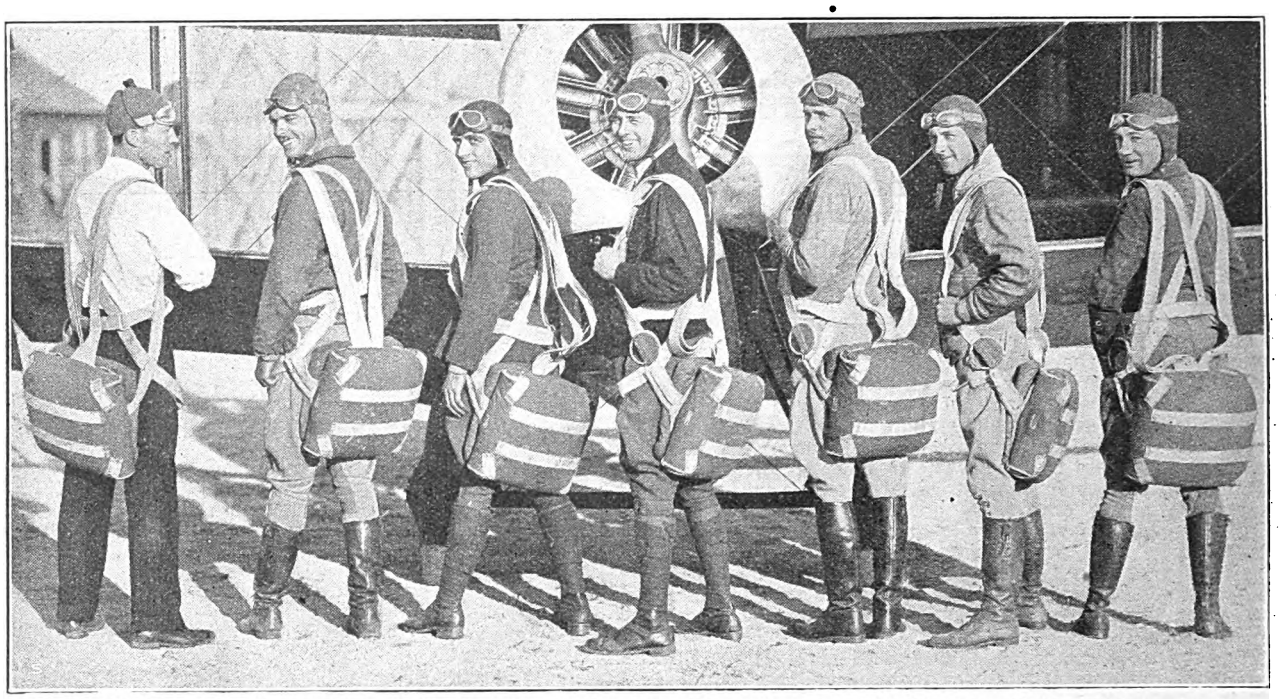

BY ERROR.—An extraordinary error in transcription gave this picture an entirely wrong title in this paper on May 14. The contents of the packs are in fact American Russell Lobe Parachutes, and the wearers are professional aeroplane crashers, parachutists and stunters, and not officers of the U.S. Army Air Corps.

WELL IN ADVANCE.

One hundred Puss Moth land-planes have been sold to date by the De Havilland Aircraft Co. Ltd. Deliveries will begin in June, according to announcements by the Company.

The Puss Moth is now undergoing float trials on the Welsh Harp at Hendon. The floats were made and fitted by Short Brothers, Ltd., of Rochester, and the machine was flown up the Thames and across London to the Welsh Harp.

WANTED, AN ARTIST.

There is a vacancy on the Staff of THE AEROPLANE for an artist-draughtsman to understudy Mr. Leonard Bridgman. He must also be able to make good general-arrangement drawings from bad blue prints. There are great opportunities for a capable man. Applications should be accompanied by specimens of work and the envelope should be marked "Artist," THE AEROPLANE, 175, Piccadilly, W.1.

AN IDEA.

The Postal Authorities, on the suggestion of Imperial Airways Ltd., have taken action which may do something towards focussing public attention on the benefits of the air mail service to India. Each two-shilling book of stamps will include two blue Air Mail "stickers" together with a page setting out pertinent information about the route to India.

One doubts whether 1% of the people who buy books of stamps ever write to India. The people who write to India are the big business houses, and they buy their stamps in sheets. They are the people on whom the benefits of air mail services should be impressed.

ADDED INDUCEMENT.

On May 15 the Westminster City Council, on the application of the London Postal Service, agreed to a recommendation to place special pillar boxes for the reception of Air Mail correspondence at Piccadilly Circus, close to the subway entrance by the London Pavilion, and in the Strand, by Surrey Street. The boxes will be painted blue to distinguish them from the familiar scarlet boxes which merely collect the earth-bound mail.

THE FAIREY SOCIAL AND ATHLETIC CLUB.

On May 17 The Social and Athletic Club of the Fairey Aviation Co. Ltd. visited Cranwell and handsomely beat the Cranwell Command at Cricket. The scores were:—

1st Innings: Fairey Aviation, 121; R.A.F. Cranwell Command, 88.

2nd Innings: Fairey Aviation, 100 for 6 wkts. (innings declared); R.A.F. Cranwell Command, 37 for 7 wkts.

A SILVERTOWN APPOINTMENT.

Mr. Owen Colverd, who has been with Silvertown Lubricants Ltd., for the past 20 years, has now been appointed to the Board of Directors. Until recently he has been Sales Manager and in this capacity extensively travelled abroad in the interests of Silvertown Oils.

Mr. Colverd's many business friends in India, Egypt, S. Africa, S. America, etc., will be glad to hear of this honour.

WACO AIRPLANES

Unequalled Value
Brilliant Performance
and Absolute Dependability

...make WACO the most popular commercial aircraft in America

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PERSONAL NOTICES.

DEATHS.

CHAPELL.—On May 14, at Ali Masjid, near Peshawar, as the result of a flying accident, L-AC. Henry John Chapell, R.A.F.

HAWKE.—On May 15, in hospital, as the result of a flying accident at Jhelum, India, on May 5, John William Hawke, Flying Officer, R.A.F.

Mr. Hawke entered the R.A.F. with a short-service commission in April, 1928, and, after a course of flying training at No. 3 F.T.S., Grantham, he was posted to No. 26 (Army Co-operation) Squadron, at Catterick. He was posted to No. 20 (Army Co-operation) Squadron, Peshawar, in October, 1929.

JARVIS.—On May 15, at Kai-Tak, China, as the result of a flying accident, L-AC. Alfred John Jarvis, R.A.F.

STROUD.—On May 17, in the Khyber Pass, as the result of a flying accident, Richard William Alexander Stroud, Flying Officer, R.A.F.

Mr. Stroud entered the R.A.F. with a short-service commission in July 1927 and, after a course of flying training at No. 2 F.T.S., Digby, he was posted to No. 11 (Bomber) Squadron, at Risalpur, India. He was promoted to Flying Officer last January.

TAVENDALE.—On May 14, at Ali Masjid, near Peshawar, as the result of a flying accident, Flt. Lt. James Charles Henry Tavendale, R.A.F.

Flt. Lt. Tavendale entered the R.A.F. with a short-service commission in September, 1925, and, after a course of flying training at No. 5 F.T.S., Sealand, he was posted to No. 32 (Fighter) Squadron, at Kenley, in August, 1926. In March, 1929, he was posted to No. 27 (Bomber) Squadron at Risalpur, India, for Signals duties.

WILTSHIRE.—On May 17, in the Khyber Pass, as the result of a flying accident, AC. Charles Samuel Wiltshire, R.A.F.

FORTHCOMING MARRIAGE.

GILLMORE—MORRIS.—The engagement is announced between Alan D. Gillmore, Flg. Off., R.A.F., eldest surviving son of the Rev. D. S. Gillmore and Mrs. Gillmore, and Kathleen Victoria, only daughter of the late Mr. F. A. Morris and Mrs. Morris, of Swindon, Wilts.

BIRTH.

ADDISON.—On May 17, at a nursing home, South Farnborough, to Marie Blanche, wife of Flt. Lt. E. Barker Addison, R.A.F.—a son.

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trump card. It was the first of its kind to be seen publicly without the ugly black-and-orange of N.F.S. and it gave one quite a fresh idea of the possibilities of these new craft, which are the only British single-engine three-seater cabin monoplanes which so far exist in quantities.

Among the interested, and interesting, visitors were a dozen members of the Liverpool Aero Club, who had flown to Brooklands led by Flt. Lt. Bernard Allen, the Chief Instructor of the Club. They were on their way to Teignmouth (Haldon) for the night, with the intention of returning on Sunday to Hooton, after visiting the new Airport of Bristol for lunch.

Several other people who might have been at Brooklands were paying a visit to the "Rallye of the Ardennes" at Luxembourg (right the other side of France) and several more were having a private "Rallye" at Mr. Norman Holden's place near Selsea. Wonderful how these private owners get about these days.

[Brooklands will need a bit of pulling together before it acquires the old prestige of the Lindsay Lloyd days. Car-parking which blocks all entrance and exit of press cars to the aerodrome, and a system which omits to send invitations to newspaper representatives, are not likely to produce sympathetic treatment by the press. Also the refreshment and sanitary arrangements, or lack of them, in the most exalted enclosure, needed a lot of improvement.—C. G. G.]

AN INVITATION.

On May 24 the Northamptonshire Aero Club will give a little display at the private aerodrome at Shortacres of Mr. Kenneth Whittome, one of the members. This aerodrome is about two and a half miles east of Peterborough and has very good approaches in all directions to its 33-acre expanse.

Lunch will be provided for all visiting pilots, and the flying fraternity are cordially invited by the giver of the feast. Arrangements have been made for some exhibition and novelty flying.

THE LIGHT AEROPLANE CLUBS

In the House of Commons on May 14, in reply to a question by Mr. Everard, the Under-Secretary of State for Air said that the hitherto unsubsidised clubs from which applications had been received for subsidy under the new regulations were Leicestershire, Northamptonshire, and Southern Aero Clubs and the Household Brigade Flying Club. The applications of the two first-named clubs had been approved. [No rumour has reached this office to the effect that the Household Cavalry have petitioned the War Office for a subsidy for their polo ponies.—C. G. G.]

READING'S NEXT SHOW.

On June 9, Whit Monday, instead of June 7 as previously announced, the Berks, Bucks and Oxon Aero Club will hold their next meeting and display. This Club is one of those in the National Flying Services chain.

This event has been described as an Air Fête to convey its sporting character as distinct from the solemn grandeur usually associated with a Pageant. One of the main events will be a race for owner pilots to Hanworth and return and a novelty race for "B" licence pilots.

All private owners and members of flying clubs are cordially invited.

FREE LANDING AT HANWORTH

National Flying Services, Ltd., announce that for the future no landing fees will be charged for privately-owned aircraft landing at the Hanworth aerodrome, and visitors arriving by air will be made honorary members of the Hanworth Club for the day.

The Company state that it is impossible to offer similar facilities at municipal aerodromes under their control in the provinces, because the municipal authorities demand payment for landings, except by members of the N.F.S. flying clubs.

FOR THEIR OWN GOOD.

Pilots intending to fly to Bristol for the Bristol International Air Pageant on May 31 are requested, and will be well advised, to bring their own picketing gear. Only those who have been faced with the problem of holding down a light machine in a heavy wind, while inventing means to secure it in the absence of proper pickets, or who have attended meetings where a hundred other machines have been staked down first, will realise exactly how thoughtful the Bristol Committee is in making the suggestion.

A GARDEN PARTY AT HANWORTH.

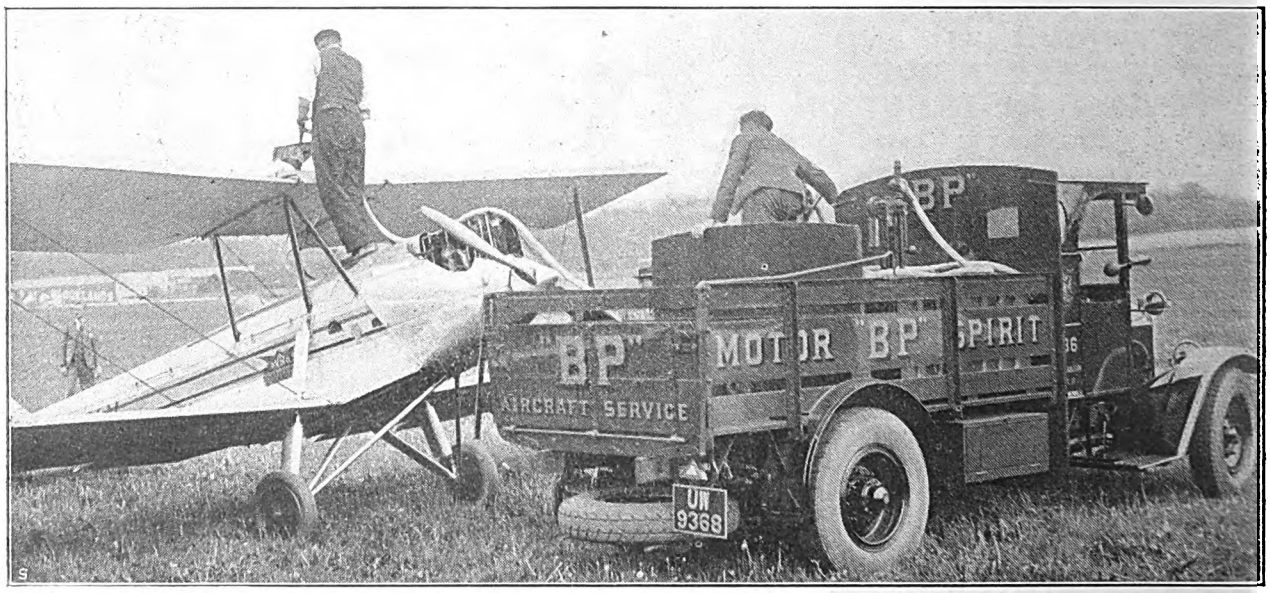
On July 19 a garden party will be held at the National Flying Services London Aerodrome, Hanworth, on the occasion of an air race round London.

The event is being instituted by Mrs. Stanley Baldwin and will be in aid of certain charities. During the race a display will be given at Hanworth by N.F.S. pilots.

The date of the party necessitates a change in the arrangements for the Hull Aero Club's meeting, particulars of which will be announced later.

WANTED—A NAME.

The new aerodrome of the De Havilland Aircraft Co. Ltd. at Hatfield will be ready in about a month's time for transfer to the new ground of the De Havilland School of Flying. At present no name has been chosen for the new aerodrome, and the De Havilland Company, at a loss for inspiration, offer a 15-minute flight in the Gipsy-Moth from Stag Lane aerodrome to the person who submits the best suggestion.



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ENGINES FOR SALE.

D.W. Aircraft Co., Brooklands Aerodrome, have for sale several new 110 Le Rhone engines complete with magnetos, carburetters and back adaptor plates. These are post-war engines with release notes and log books.

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The Aircraft Operating Co. Ltd., 8, New Square, Lincoln's Inn, London (Holborn 8131), and Bulawayo, Southern Rhodesia; Cairo, Egypt; Rio de Janeiro, South America; Contractors to the Ordnance Survey. Laboratories and Subsidiary Companies for aerial photography in the British Isles, Aerofilms Ltd., Colindale Avenue, Hendon (Colindale 6183 and 6184).

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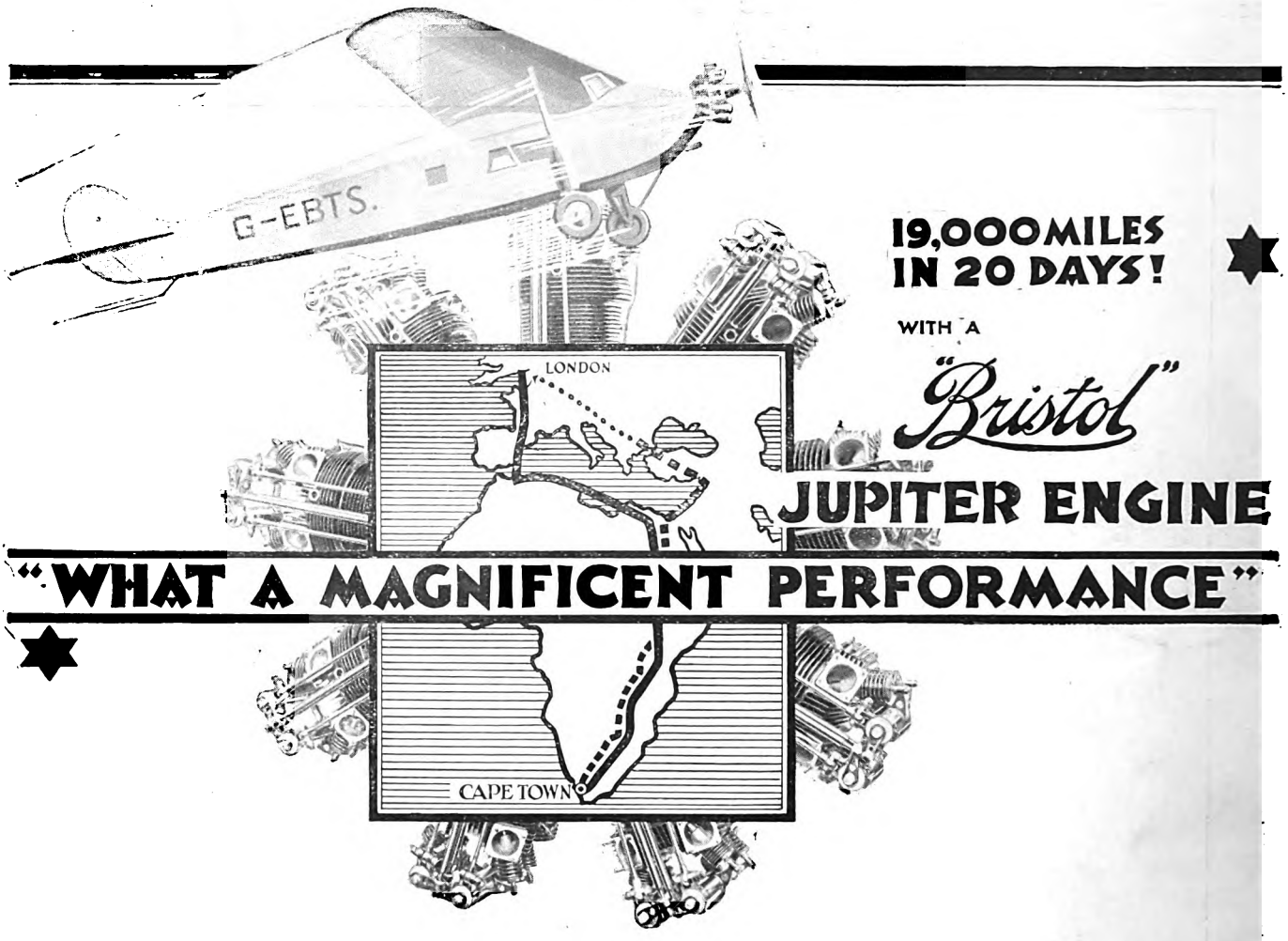

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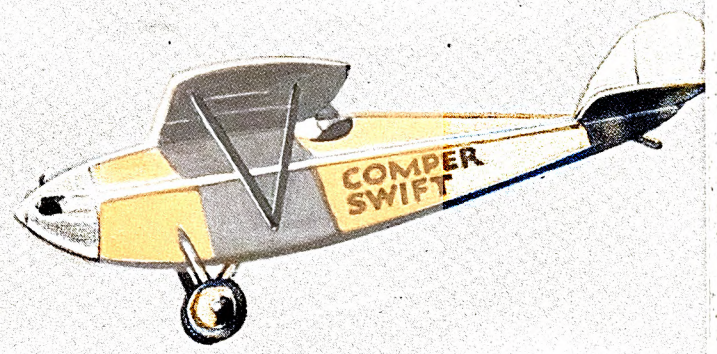

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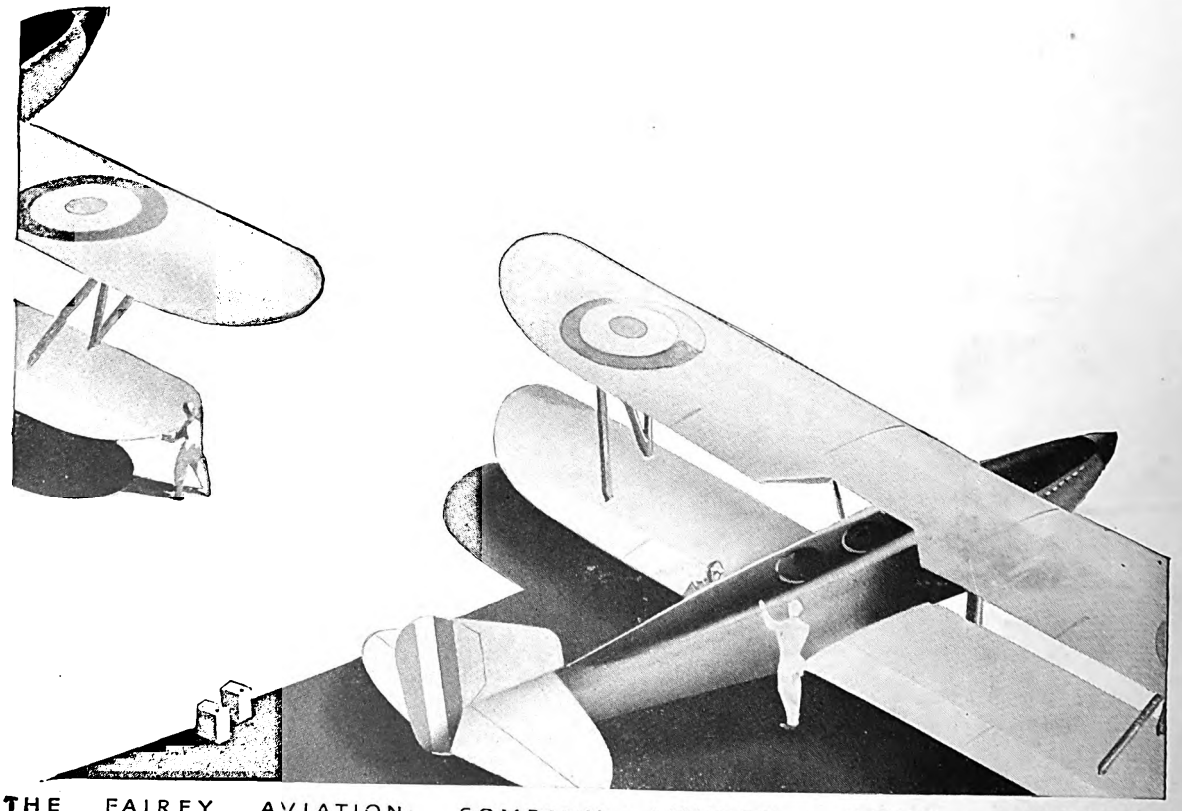

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Incorporating

Aeronautical Engineering

VOL. XXXVIII No. 22.

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ON HUSTLING PROGRESS.

Mass psychology is a queer thing. Can anybody explain just why we should be so excited, or, to use the expressive American phrase, all het up, because Miss Amy Johnson has successfully reached Australia by air?

Admittedly hers was a magnificent performance and one confesses to being as keenly interested in her progress as anyone could be. But, barring the fact that it was all done at one stretch, so that the newspapers were able to make an exciting serial out of it, was it intrinsically either a better flight or a more dangerous flight than was Lady Bailey's flight round Africa with an aeroplane and an engine which had not at that time been so highly developed as those used by Miss Johnson?

The last four hundred miles, from Timor to Darwin, is certainly one of the most dangerous flights in the World because there is practically no shipping either along or across the route, and four hundred miles is a long stretch for a single engine of any size or power. The fact that the sea is infested with sharks makes the flight sound more terrible in the newspapers, but does it in fact add to the terror? Is dying from shark-bite any more unpleasant than dying from mosquito-bite as Lady Bailey very nearly did in the Belgian Congo? Or is sitting in a sinking aeroplane for several hours in an ice-cold sea without hope of rescue any more pleasant as a form of death than being swallowed at one gulp by a shark?

Another difficulty which faces us when we have to write about this journey is that if we hail Miss Johnson's performance as something wonderful for a woman we raise the ire of all those advanced feminists who claim that a woman's performance should be judged simply as a performance, alongside the best that a mere man thing can do, and that there should be no allowance for sex, despite the examples of the Derby and the Oaks to the contrary. Judged as a pilot's performance it was just a very good flight. Judged as a woman's performance it was wonderful.

A Basic Truth.

Actually the finest corrective to the hysteria of the Daily Press was the simple message sent to Miss Johnson at Darwin by that excellent organisation, the Returned Soldiers' League of Australia. Their message said,

> We welcome you as the embodiment of that spirit which prompted British womanhood during the War to innumerable acts demanding the qualities of self-reliance, endurance, resoluteness and sheer pluck.

Probably some sub-conscious appreciation of the idea thus clearly and briefly expressed is what underlies the enthusiasm over this flight, which otherwise might seem excessive when judged coldly and logically.

Miss Johnson was two days quicker getting to India than was Mr. Bert Hinkler, but she took a short cut which he did not take, and saved several hundreds of miles. She lost her lead by an unlucky landing, but the unlucky landing was primarily caused by the fact that she chose her starting date more or less haphazard without due regard to monsoon weather, whereas Mr. Hinkler had considered his flight in all possible aspects before starting. Which shows the difference between dash and daring alone, and dash and daring coupled with organising power.

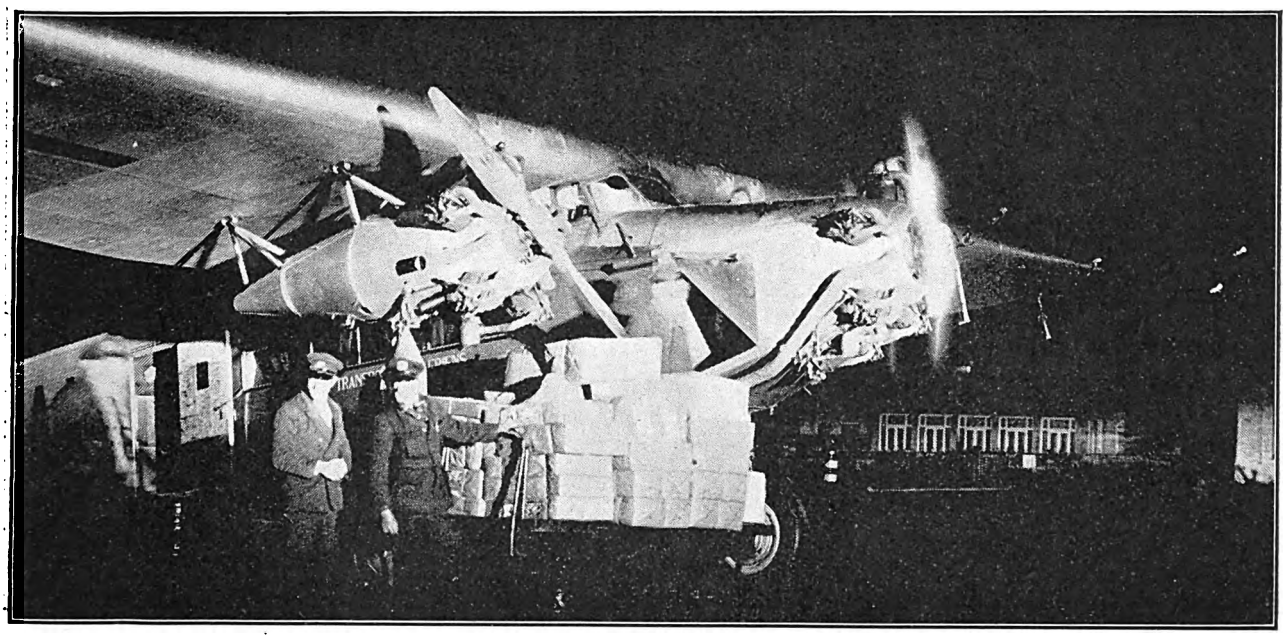
The Race Question Again.

Those who are inclined to scoff at racial peculiarities and try to argue that one breed is as good as another will find some difficulty in answering the definite statement made in *The Times* of May 26 that Miss Johnson's name ought not to be Johnson but Jorgensen, because her father's father is a perfectly good Dane of that name from the Island of Fyen, and is still alive at Bridlington. All her photographs show her as being of the distinctly Scandinavian type.

As Yorkshire is mostly populated by Scandinavians there is very little difference between whether her grandfather came from Scandinavia a few years ago or her ancestors came from Scandinavia a few centuries ago. Also her father's mother's name was Holmes,—which is very much a Yorkshire name and essentially Scandinavian.

The really interesting point is that practically all the big flights of the World have been done by people who are quite distinctly either directly Scandinavian like Lindbergh,

"THESE MOST BRISK AND GIDDY PACED TIMES."—(Shakspeare—*Twelfth Night.*)



WITH THE NIGHT MAIL.—A trimotor Fokker (three Bristol Titan radial engines), belonging to the Sabena firm of Brussels, disgorging mails and freight at 03.00 hrs. at Croydon. Thus do our competitors from other countries hasten developments for us. —(*"Aeroplane" photograph.*)

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or obviously of Scandinavian ancestry like Jack Alcock, or of Scandinavian-Scottish blood like Ross and Keith Smith, or of slightly more Southern Nordic breed like Van Ryneveld and Brand. One might justifiably include in the list Alan Cobham, who is quite clearly of the light-haired light-eyed type.

Anyhow, Miss Johnson's flight deserves to be historic because she was the first woman to fly alone to Australia. Mr. Hinkler's voyage was quicker and Mrs. Keith Miller was the first woman to fly there. But Mrs. Miller had Mr. Lancaster as co-pilot,—though the fact that their Avian (with its Cirrus engine) was carrying two people made the voyage the more remarkable. In fact it has never been publicly recognised at its full worth.

A Question to be Answered.

There is one incident in connection with her flight which certain newspapers ought to explain. When Miss Johnson arrived at Karachi these papers reported her as saying that before she left England she had got no support and no encouragement from anybody, but now she had reached India in record time offers of financial help had poured upon her—or words to that effect. This left one to assume that somehow or another Miss Johnson, presumably through her own family, had scraped together enough money to buy her Gipsy-Moth from Mr. Lawrence Hope of Air Taxis Ltd., and had enough left over to buy petrol and oil as she went along.

At the Dinner to Lord Wakefield the other night Sir Sefton Brancker let out the fact that Lord Wakefield had definitely financed the whole flight, that is to say he had put up the money to buy the machine and had arranged for supplies of petrol and oil all the way along the route. And the two statements do not tally.

No doubt Miss Johnson had been asked by Lord Wakefield, and possibly by Sir Sefton Brancker, not to say anything about having been thus financed. Lord Wakefield likes to keep most of his benevolence secret. And he only agreed to finance Miss Johnson after much importunity. Naturally, if she had failed, and if his financial help had been known, there would have been enemies to gird at him for encouraging such a crazy undertaking. So there was every reason for keeping quiet about money matters. And so no doubt Miss Johnson loyally refused to divulge to newspaper people in India the name of her financial backer.

But there is a very wide difference between that and saying definitely to newspaper men that she had not been able to get any support. Therefore one suggests that the papers which published such a statement ought to explain themselves or their correspondents.

The Commercial Point of View.

After allowing our very natural enthusiasm over Miss Johnson's flight to cool down we may quite reasonably consider the various great flights of the last few days from a purely commercial point of view.

Miss Johnson's flight has demonstrated once more, as has been demonstrated already more times than can be counted, the fact that British light aeroplanes and their engines are about the most reliable vehicles in the World,—not excluding railway trains and steamships. Her flight has also demonstrated how easily a thoroughly well organised air-mail line could be run to Australia.

And here we must not forget that the Far East Squadron of the R.A.F., with its Southampton flying-boats and Napier engines, based on Singapore, have demonstrated that a quite regular air service can be maintained between Calcutta and Singapore in monsoon weather which would make flying impossible for the best of light aeroplanes.

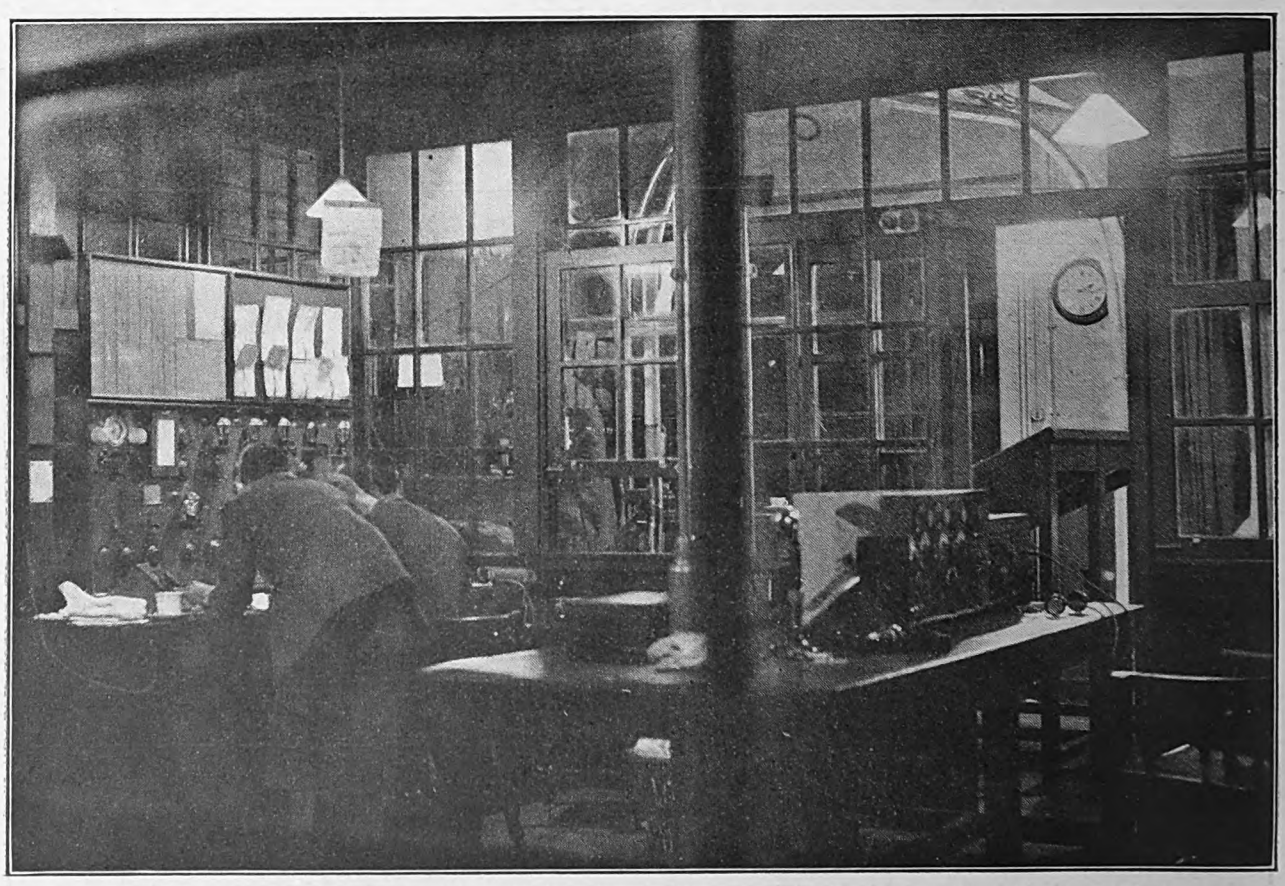
All this was proved some time ago and Miss Johnson's flight is very useful confirmation. But there is another side to the question.

Air transport, and especially air transport of mails, is most useful between England and those countries where we are most likely to do business at a profit. India is in a state of social chaos, thanks to our futile government of a population which only understands a heavy hand or a thick boot. Australia, though potentially immensely wealthy, has practically suspended payment of all her debts, largely because of socialistic mishandling of labour problems and immigration. Consequently, there is not much money to be made out of air transport to India and Australia for the present.

In the meantime, while we are spending money and effort, not to mention enthusiasm, over that route, we have passed over comparatively unnoticed two very important routes which, if they were operated by us instead of by other nations, might have brought much profit to this country and to the people who might run the air line.

Two Historic Successes.

On May 12-13 Monsieur Mermoz in a French monoplane with floats flew from the West Coast of Africa to the East Coast of Brazil with the first load of air-mail to be carried direct from Paris to South America.



SHIPS THAT PASS IN THE NIGHT.—The interior of the Control Tower at the London Aerodrome, Croydon, at 02.16 hours (see clock in background) on May 20. The incoming Sabena, OO-AIL, has just been steered safely past the Brussels-bound, OO-AIJ, east of Dover.—(*"Aeroplane" photograph.*)

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Unequalled Service!

"THE general reliability of British aero engines has frequently been demonstrated, but the world generally does not realize how year in and year out long Service flights are undertaken with such complete immunity from trouble that the intrinsic value of the performance is overlooked. There are certain flights now carried out by the Royal Air Force each year which are not paralleled in any foreign air service, and Mr. Montague, the Under-Secretary of State for Air, has performed a useful service to British aviation in general by drawing public attention to them in Parliament during the debate on the Air Vote . . .

"It is not without significance that in every one of these flights the power unit was the Napier Lion, an engine which is giving unequalled service not only at home but also abroad in every sort of climate, hot and cold.

"The equipment of No. 205 Squadron, it is worth recording, is made up of Supermarine Southampton flying boats, with metal hulls; in fact, these are the identical aircraft which made the historic flight from England to Australia, back to Singapore and then on to Hong-kong, finally returning to Singapore after flying 27,000 miles."

The Times Trade and Engineering Supplement
26th April, 1930.

IMPROVE THE RELIABILITY AND EFFICIENCY OF YOUR AIRCRAFT BY INSTALLING THE

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On May 22 the airship *Graf Zeppelin*, commanded by Captain Eckener, arrived at Pernambuco after flying direct across the South Atlantic from Seville in Spain. The *Graf Zeppelin* took with her mails which had been flown direct from Germany to Seville.

Thus we find Paris and Berlin directly in touch by air-mail with the whole of South America. Naturally, if people in England want to accelerate their business with South America they can always send their letters to Paris and have them flown by the French air line. In a year or so they may even be able to send them to Berlin and have them flown by aeroplane and airship to South America quicker than they could get them there by any of the three or four British steamship lines which carry His Majesty's mails to South America.

Of course we can argue perfectly well that so long as we do the business with South America we do not care who carries mails for us. In fact we may even pat ourselves on the back and think how clever we are to let these misguided foreigners run air-mail lines at a loss to themselves so that we can do business because of them.

TRADE AND THE FLAG.

That may be true up to a point. But trade follows the Flag. And we have not been doing any noticeable amount of flag-waving in South America for quite a while.

Certainly that enterprising firm the Aircraft Operating Co. Ltd., has been impressing on Rio de Janeiro the efficiency of British air survey work. And Mr. Sydney Holland has been showing other parts of Brazil that British light aeroplanes and pilots really can fly. And Major Kingsley has been doing good work in Argentina. But one doubts whether their gallant efforts have been as impressive to Brazil and Argentina as have the regular air-mail services of the French *Compagnie Générale Aéropostale* and of the the German *Kondor Syndikat.*

There is to be an All-British Exhibition of a considerable size at Buenos Aires in March of next year. And the Admiralty have graciously offered to send one of our aircraft carriers to that exhibition, provided that the British Aircraft Industry will pay for oil fuel.

When the Admiralty have sent a whole squadron of warships to odd out-of-the way corners of the World to show the flag and impress on the local inhabitants the might of the British Navy, the Admiralty have not asked the ship-building and armament firms whose goods have been represented in that squadron to pay for the coal and oil, although the British Ship-Building Industry has benefited mightily by these flag-showing expeditions. Therefore one would have imagined that the Admiralty could very well afford to send an aircraft-carrier to Buenos Aires at the Nation's expense if only to impress on South America the mightiness of the Fleet Air Arm.

On the other hand, if the Admiralty is ready to take samples of all the various types of aircraft made by the members of the Society of British Aircraft Constructors, and is ready to let the sacred ship be used as a kind of floating showroom for British aircraft at Buenos Aires, then the Trade certainly ought not to jib at paying the oil-bill.

If that ship does go to Buenos Aires with samples of British Aircraft we may be able to get back something of the prestige we have lost through allowing the French and the Germans to get to America first with their air mails. But we shall need to put up a very good show if we are to outweigh the effect which must have been produced by something over a hundred French aeroplanes being in constant service between Santiago de Chile, Buenos Aires, Rio de Janeiro and Pernambuco on the C.G.A. service.

Of course in making arrangements for the All-British Exhibition, the French air-mail line will be of the greatest convenience to us. And to that extent we ought to be grateful for French enterprise. But at the same time one cannot help regretting that our business letters for this great occasion will not be carried in all-British aircraft,—which we know to be the best in the World if only people will order the right types and use them in the right way.—C. G. G.

WITH THE NIGHT MAIL.

BY F. D. BRADBROOKE.

It was a night of lights, lights, lights; but it all began in the control tower. In there were little flags which Mr. J. J. Jeffs, the officer on duty, stuck in a big map and moved about rather like an old lady making pillow lace.

His pattern was not involved because the time was close on 01.00 hours and nearly all the little flags were stuck below in rows signifying their lawful nightly hangars, but two were on the map, one at Gravelines and another at Lympne. They were slantwise, their pennants touching the board.

"What are those?"

"Oh, that's McClure and that's Miss Spooner; both down for the night. News of McClure is not too good. Seems to have had bad luck landing. This is the *Sabena* outward bound from Brussels to London. Listen to him."

Mr. Jeffs indicated the loud speaker high up on the glass wall which enclosed the mass of wireless workings. It stopped emitting Morse squeals for a moment, and a French voice could be heard dimly. We put on the head-phones.

"'Allo Sabena IL! 'Allo Sabena IL! Votre position est dix kilometres au sud-ouest de Dunkerque. Je vous écoute."

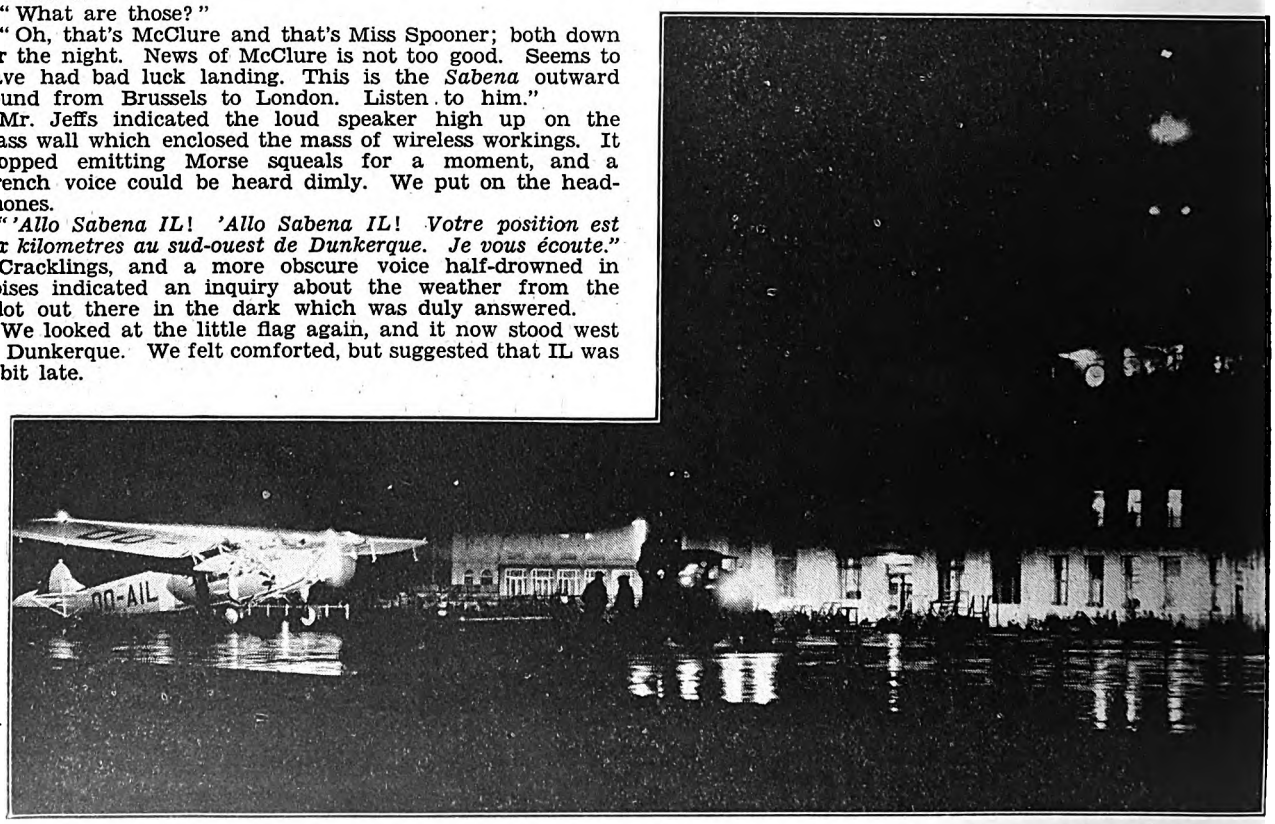
Cracklings, and a more obscure voice half-drowned in noises indicated an inquiry about the weather from the pilot out there in the dark which was duly answered.

We looked at the little flag again, and it now stood west of Dunkerque. We felt comforted, but suggested that IL was a bit late.

"Oh yes. Head wind. You'll have a tail wind; and of course we shall be in touch with you all the time. That's your call."

Mr. Jeffs referred to shouts from the tarmac where a Fokker of the Sabena Line stood muttering with its three Bristol Titans. We took one look at the lowering clouds and were unfeignedly glad that there were three.

Our bag had preceded us into the cabin, which already contained mail and two seats. The windows were covered



THE INCOMING MAILS.—A Sabena (Belgian Air Lin es) Fokker (three Bristol Titans) taxying onto the apron at 02.55 hours. —("*Aeroplane*" *photograph.*)

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with a heavy curtain, all but a little near the chairs, and the lights in the roof glowed dimly.

Further shouting outside indicated the absence of Mr. Patrick O'Neill, British representative of Belgian Air Lines (Sabena). M. Edouard Sobry, first pilot, walked up through the cabin and the Titans emitted streams of sparks and roars of protest. M. Stevens, second pilot, followed him into the cockpit, and the Belgian air mail to Brussels waited for an Irishman. The time was 00.56 hours.

With a minute to spare Mr. O'Neill arrived smiling, and almost before he was seated the cabin lights went out and the engines roared up. A floodlight showed the grass as if hoar-frosted, and the machine began to bounce as it gathered speed. The bounces lengthened as we became air-borne, the wheels lifted and the little red, winking boundary lights swept underneath.

M. Sobry climbed at once to 300 metres, and the clouds shut us in. Mr. O'Neill suggested that it was not a good night—with which we ventured agreement—and explained that one must have a certain height over Biggin Hill, where the weather always seemed to be thick.

In the cabin it was completely dark. Through the little window forward the instrument board was a maze of little, shivering blue phosphorescent points, and the pilots sat motionless. The effect of Sphinx-like inscrutability was admirable, until a little lamp flashed up and M. Stevens (whose name is Flemish, not English) fiddled with a stack of little levers like old-fashioned motor-cycle controls. They were the remote controls for the wireless telephone. A little gesticulation, and the light went out again. More marvellous immobility.

We crept back through the pitch-dark cabin to our window, outside which was one Titan in full blast, and pandemonium. At the moment we were still in clouds. The twin exhaust ports of each cylinder showed rings of flashing blue, the exhaust pipes not being a gas-tight fit, and the outlet from the main ring trailed a streamer of blue flame which flickered on the wing above and the mud-guard of the wheel below.

In the thickest of the fog the vivid blue light reflected back and lit up every detail, but at intervals a black opening flashed past with peaceful terrestrial lights visible for a moment—very close—but always the blue glare jumping from a semi-circle of leading edge and the mud-guard. The luminous dial of the cabin altimeter still showed 300 metres. The clock indicated 01.20. Must be over the Downs.

Further telephony in the cockpit, and soon the ground lights became more steadily visible, scattered, at intervals in groups and patterns. A mass of lights and a Neon beacon showed Lympne. Folkestone followed soon after with long rows of illumination. M. Sobry had descended to 200 metres and dim patches of field could be made out below.

The coast was still well to the right as we approached Dover, glittering still, in spite of the hour, with lights about the harbour, on Citadel Hill and Castle Hill. The coastwise lights of England flashed at their settled terms below us; and, in the distant mists, a flash to Southward seemed to be from France.

Suddenly the Doverward wing dropped and the Fokker started to turn. Hurried consultation occurred between the passengers, with a finding to the effect that a landing would be made at Lympne owing to fog ahead. But the machine straightened out seawards, and on the port beam *Sabena IL*, to whose conversation with St. Inglevert we had listened an hour back, rode by in the darkness, his navigation lights twinkling distantly.

Sold again. The passenger list realised that Mr. Jeffs, a hundred miles away in his comfortable eyrie, knew more of what was happening to them than they did themselves, and nursed a deep sense of injury for five minutes.

But the Channel was underneath, with little winking boats and a swell visible in the rays of a huge light which revolved slowly and swept the seas around with its fifteen or twenty beams. We didn't know what light it was, but it was an impressive cartwheel of brilliance.

In mid-Channel a big liner ploughed eastward brilliantly lit. The *Bremen* had left Southampton for her name city that evening and we were quite certain it must be she. We should have felt injured again if we hadn't been.

Out of the range of lighthouses the night was dark as pitch, and as we were flying at about 150 metres the ceiling must have been very low. The Fokker rode through occasional patches of mist, but in general the view was bounded by clamourous blue flame and adjacent bits of structure.

The cabin was warm, and as it was too dark to find the heat control we opened the windows to enjoy the cool air and Titanic voices. The peculiar rhythm of three five-cylinder radials, each constantly coming into and out of phase with either or both of the others, takes some getting used to if one is used to single-engined machines.

Out of curiosity we stuck our heads into the 120 m.p.h. slipstream and saw the tail standing out in the darkness lit by the rear navigation light. Down below were flecks of pale light. I mentioned this important matter to O'Neill, and we wisely decided that a ground mist must be diffusing the scattered lights of Belgium. But there were a lot of them. After further prolonged inspection, in the knowledge that we were scarcely more than 100 metres up, they turned out to be the white-caps of the Channel, visible in the pitch dark through some mild form of phosphorescence.

Then Calais appeared to starboard, and from there to Gravelines we could vaguely discern the sand dunes and the beach, which impressed us as a nice, broad, smooth place to fly over at night. We left Dunkerque to port, and every few minutes the beautifully noticeable airway beacons which light the entire route to Brussels flashed in the cabin windows. These occur every 20 kilometres or so, and although M. Sobry didn't say so we feel sure he finds them a comfort. We did, but we hadn't been flying the route regularly for six years, as he has.

The beam wireless masts at Ruyssleed showed up to starboard with three lights on each one of the eight. This station provides direct wireless touch with the Belgian Congo where other Sabena aeroplanes are doing a job of work.

Alost is impressive by night, from a few yards up. We passed directly over it and could see the wide deserted streets, illuminated in little circles round each lamp post and along the fronts of the houses, so that the streets stood out sharply as channels of light among the dead black

THE NIGHT MAIL.—The Brussels mail being unloaded from a Sabena (Belgian Air Lines) Fokker (three Bristol Titans). The time may be noted by the aerodrome clock.—(*"Aeroplane" photograph.*)

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ENGLAND TO AUSTRALIA!

We desire to offer our most sincere congratulations to Miss Amy Johnson upon the completion of her remarkable flight rom England to Australia in a "Moth" light aeroplane.

While she has been disappointed in her attempt to reduce the time of 15½ days taken by Sqdn. Ldr. Hinkler on his pioneer flight in a Cirrus Avian in 1928, yet her achievement is a great personal triumph and serves to emphasise once again the excellence of British Aircraft productions.

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of the houses. There are fine squares, and an occasional wayfarer who turns a little white face up at the shattering disturber of the peace.

A few more minutes of blackness and Brussels sweeps underneath, with lights reflected in the River Senne, shipping, and motor-cars pushing beams of light along the luminous trenches which are the streets.

At the aerodrome the floodlight is on and the illuminated tee shows that we must take three-quarters of a circuit before coming in to land. A Vérey light goes up and the Titans subside for the first time in two hours, trailing thick streams of sparks instead of the eternal blue flame. The wing-tip almost seems to graze the roof-trees of peaceful Belgian citizens as M. Sobry turns in and glides low over the fence.

OO-AIJ is logged in at exactly two hours for the run, which is, as usual, well under schedule. But there was a light south-west wind of about 12 m.p.h. so that the weather neither helped nor hindered and the luminous indicators on the outboard engines had been registering less than 1,575 r.p.m. all the way.

The Right Way.

There is no more logical way to carry mails than to fly them by night. The bag which shared with us the cabin of OO-AIJ contained letters that had been posted in London as late as 23.00 hours the night before at the G.P.O. They would be delivered by the first post in Brussels or Antwerp that morning. But the bag weighed very few kilos.

On the other hand, *Sabena IL* passed us en route to London with 900 kg. of mail and freight, which is a story repeated nightly. The business between the two capitals cannot be as one-sided as all that, so the explanation is limited to the factors of patriotism and price and business horse-sense. The Belgian Post Office is accepting mails at ordinary postal rates for the first three months of the service, which was started on April 14. For a further three months a special air mail fee of half the usual surcharge will come into effect.

From London an air mail fee of 2d. per oz. is charged over and above the usual 2½d., making 4½d. for a letter of not more than one ounce, and one must assume that this helps to make the difference between 20 kg. outward from London and 900 kg. back.

In six months, when full rates come into effect from Belgium, the truth may appear. The reliability of the service cannot be impugned. There have been delays due to weather in the past six weeks, but no cancellations and no failures to arrive in time for an early delivery. Belgian Air Lines have a record of six years' passenger service without an accident involving injury, and the excellence of their equipment is such as to reduce to a minimum the admitted difficulties of night-flying.

As a sop to public ignorance the firm has decided to call itself Belgian Air Lines, in England, and it is only a pity and a reproach that a name with so good a record behind it as *Sabena* should be relegated to the background. It is a commonsense cryptogram for *La Société Anonyme Belge d'Exploitation de la Navigation Aérienne.*

The comparative thoroughness with which the night mail has been tackled on either side of the Channel is strikingly shown by the "street lighting" from Brussels to the coast, and the trackless waste on the English portion of the route with Cranbrook beacon, Lympne, and the coast lights as the only relief. Obviously the General Post Office is not interested in fly-by-night interference with the immemorial and sacred methods of letter carrying.

The credit due to England on the London—Brussels service is much the same as that conceded to England by the great Mr. Will Rogers for Miss Gertrude Ederle's Channel swim. He remarked that if England hadn't thoughtfully provided a beach for her to land on she'd have been swimming yet.

At the Brussels office of Sabena we met M. E. J. Godtschalsk, *Chef d'Exploitation,* who is an old and distinguished pilot. He added to our information in the most courteous way.

More Aircraft for Sabena.

In Brussels on the Haren Aerodrome is the factory in which *Sabca* (*Société Anonyme Belge de Constructions Aéronautiques*) make Fokker aircraft and Bristol engines under licence. Most of their output is bought by *Sabena*—which creditable name we insist on using while in its native city. Inside are Fokker fuselages, with the welded construction which becomes familiar after visits to Hazebrouck Heights, N.J., U.S.A., and to Manchester where they make Avro Fives and Tens; and huge wooden wings in all stages of construction.

A new metal high-wing monoplane is being built for the *Sabena* service in the Congo, called the S.11. It is designed for three Jupiter engines and 25 passengers. At present it is in a fairly primitive state, but the wings are built of metal lattice spars with a non-corrugated metal skin.

Sabca has orders for 24 machines of the same size as those used on the night mail and daily passenger services operated between Brussels, London, Antwerp, Hamburg and Paris. Six of these are for service in the Congo.

A Titan, built under Bristol licence, was under test outside on the stand, but as word came that M. Sclosset was ready to take off for Antwerp we postponed a visit to the engine works and went aboard. Fifteen minutes later we were in Antwerp, where the aerodrome is much smaller but very busy. To-day there were many perturbed and ceremoniously attired gentlemen on the cinders, and a nonchalant Fairey III.F in the foreground.

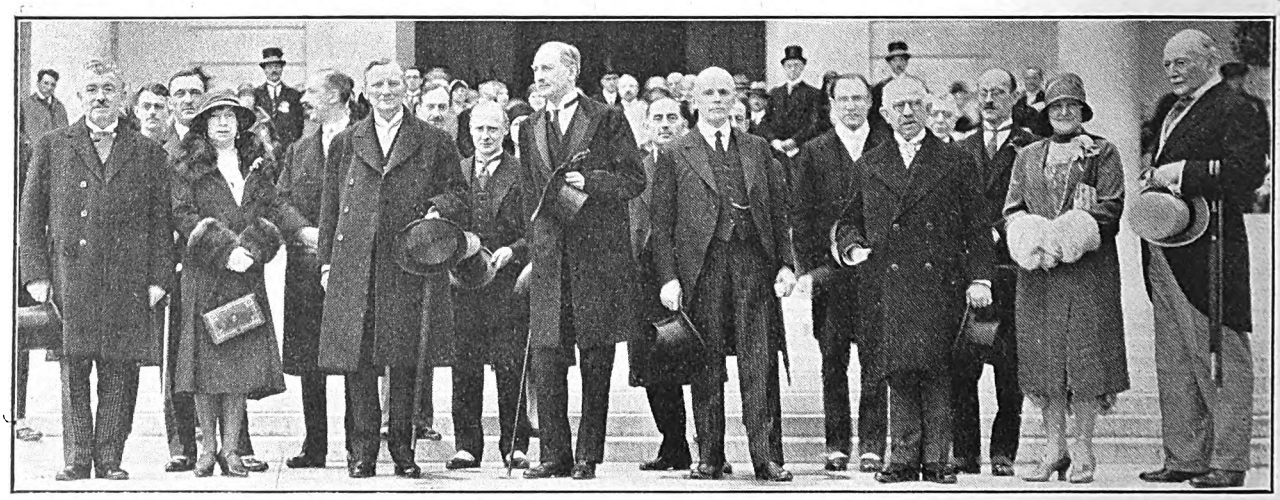
Lord Thomson, Secretary of State for Air, was due in the city to assist in the official opening of the British section of the International Exhibition, but had not arrived. Just before our arrival the London—Antwerp service of *Sabena* had landed, and reported that the Fairey carrying Lord Thomson had landed at Ostende owing to fog. Collecting the member of our household who had landed in the aforesaid London—Antwerp plane we proceeded to the city and to the *Exposition Internationale et Coloniale.*

The Antwerp Exhibition.

This World's Fair is not strikingly different from previous fairs elsewhere at first sight, and impresses one with dim recollections of the White City many years ago, and Wembley of more recent date. Although it has been open to the public for a month there are large sections of it still unfinished, including much of the Belgian exhibit.

A signboard informed us that the British grounds were penetrable only by invitation card, and armed guards confirmed the intelligence first in apparent Flemish, then in French. While waiting for results to ensue from a card of uninvitation, despatched by a friendly Boy Scout, we had leisure to examine the fine site allotted to Great Britain and the admirable results secured from it by Sir Edwin Lutyens, who was the architect. The dignity of the building is achieved by its simplicity, and its grounds slope to the moat which entirely surrounds it on the exhibition side so that it can be reached only by three bridges. A dome surmounts the great central hall, and wings of the building form galleries for exhibits.

The opening ceremony was imminent, and the atmosphere of ceremony first observed at Haren Aerodrome per-



THE OPENING CEREMONY.—The Earl Granville (British Ambassador in Brussels) and Lord Thomson (Secretary of State for Air) at the opening of the Antwerp Exhibition.

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sisted in full force and radiated even to the far shores of the moat.

The representative of THE AEROPLANE was at last accorded permission to cross the moat, and to take a prideful look at the Supermarine S.6 which stands in the grounds in full view from all sides.

At 15.00 hours the opening ceremony began in the central hall with a flourish by two trumpeters of the Royal Horse Guards. Sir Henry Cole, Commissioner-General of the Government of Great Britain at the Antwerp International Exhibition, formally asked Lord Granville, British Ambassador at Brussels, to open the British pavilion, which his Lordship proceeded to do, speaking in French to the distinguished gathering.

In reply, M. Heyman, Belgian Minister of Labour, thanked His Lordship and made flattering references to Anglo-Belgian relations in the past, throughout the reigns of the three Kings of Belgium whose statues stood under the great entrance arch of the Exhibition.

Lord Thomson, who arrived opportunely, apologised for his lateness and expressed hopes for further peaceful and close aerial co-operation between the two realms. He rightly stated that British visitors would take a particular pride in the exhibit of a Supermarine of the type which won the Schneider Trophy, and inside the building, the actual engine.

THE BRITISH EXHIBIT.

The pavilion is really no larger than those of most other countries represented, and certainly the exhibits are less crowded. But from the exterior appearance of the building to the arrangement of the exhibits inside there is a restraint and dignity which give cause for pride. The utmost has been made of situation and lighting by Professor Richardson.

In the central hall is a large sunken map of the world, of which the land portions are lighted from beneath by lights which illuminate the whole map, and then parts of the British Empire by turn, dyeing them a rose-colour.

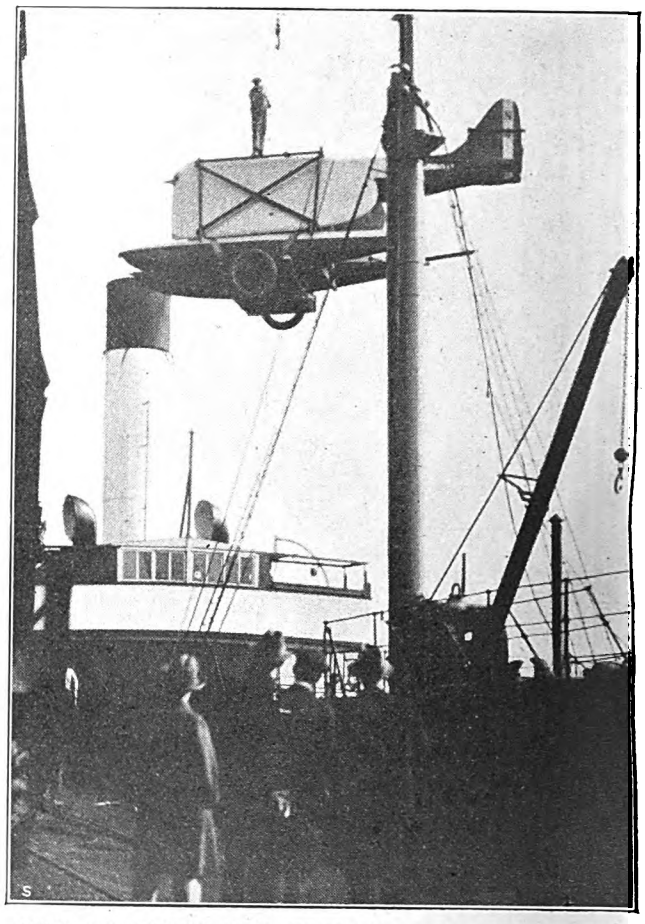
The intervening oceans, which contain real water, are sailed by tiny ships which crawl from port to port with realistic ripples. It is true that they go about and steam home again just before reaching their destinations, and are a little bit suggestive of water beetles to irreverent imaginations, but the general effect is quite fascinating and the surrounding rail is thronged with admirers.

About the hall are six alcoves, of which two contain portraits of their Britannic Majesties in splendid settings. The others contain windows with lighted panoramic canvases behind to suit the style of window. For instance, the spectator looks from a scale replica of Captain Cook's cabin in the stern of the *Endeavour* to a view of Plymouth as it was when he left for Australia. One can also look through the window of the original Royal Exchange on the Thames-side prospect of 200 years ago. Around the roof are panels representing various periods and Colonies.

The naval and marine exhibits are most extensive and interesting, and a series of dioramas representing the gradual improvement of the English race by successive waves of invasion is intriguing.

OUR AIR EXHIBIT.

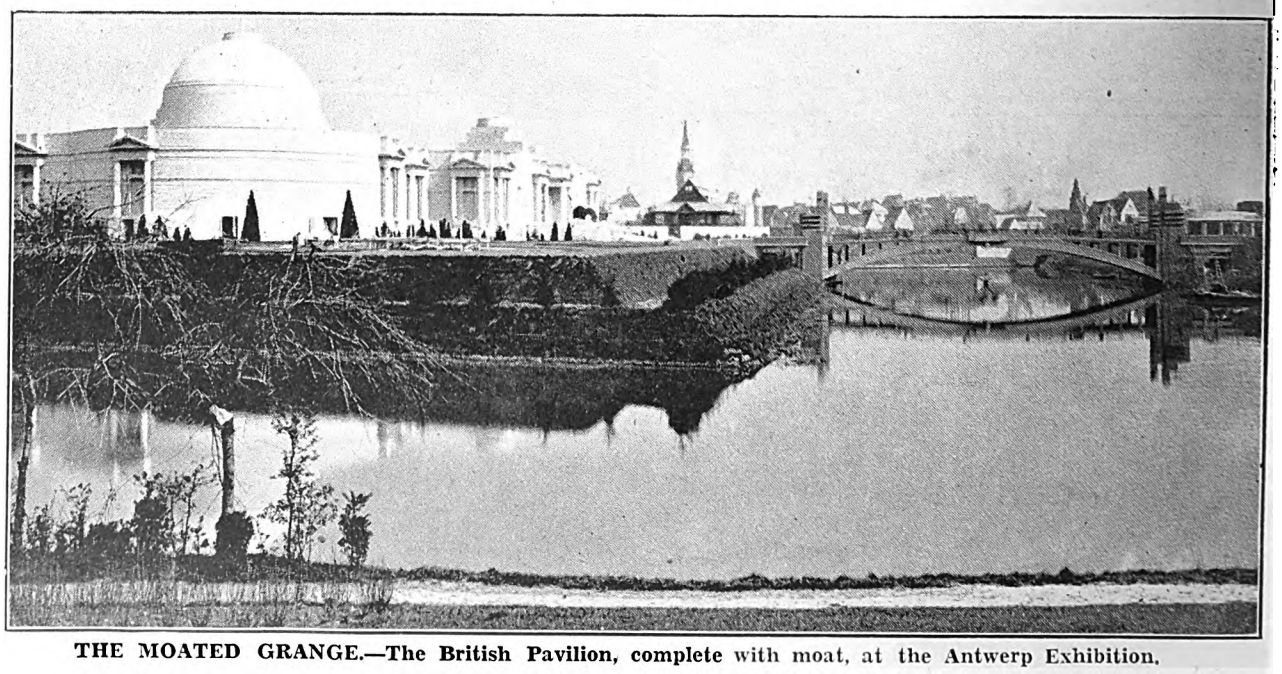
The aviation exhibit starts outside the great doors with the Supermarine S.6. Inside is the Rolls-Royce R engine which actually won the Schneider Trophy, and the Napier engine which won it in 1927.



NOT QUITE IN HER ELEMENT.—The Supermarine S.6, winner of the Schneider Trophy, 1929, being transported to Antwerp for Exhibition.

By way of showing British workmanship in the air-cooled field a great Armstrong Siddeley 14-cylinder 800 h.p. Leopard stands next in line. It is not dressed for show, and there is a thrill in its massive ruggedness and the fine workmanship which examination reveals. A polished Cirrus III represents the smaller fry.

Models of the fuselage of the Handley Page 40, the passenger quarters of the R.101, the top of the mooring tower and attached nose of the airship with passenger gangway, and of the R.101 itself, are placed at one end of the hall, and at the other appears the *Coupe Schneider* itself and a large plaque recounting the World's Records in aviation which are now in British hands. A large map illustrates



THE MOATED GRANGE.—The British Pavilion, complete with moat, at the Antwerp Exhibition.

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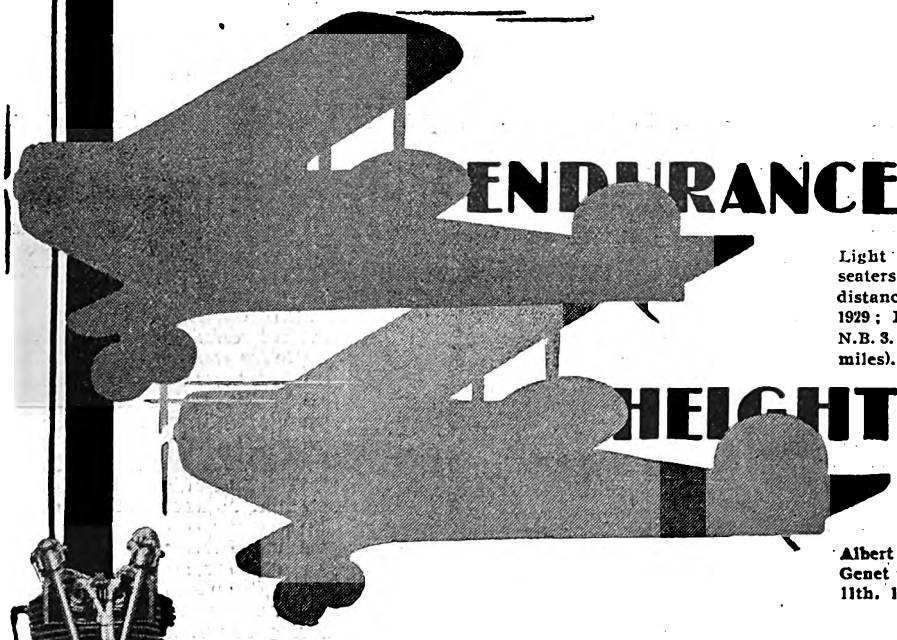
2 WORLD'S RECORDS

OF THE ARMSTRONG SIDDELEY GENET

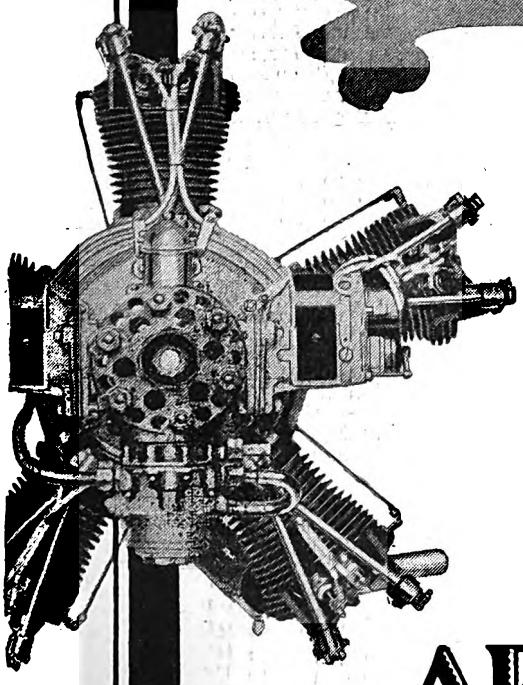


ENDURANCE RECORD

Light Aeroplanes, 3rd category, single seaters, weight 200-350 kgs. (440-770 lbs.), distance in a straight line, July 17th, 1929; D. S. Zimmerly, Barling, U.S.A., N.B. 3. 80-88 h.p. Genet, 2,500 kms. (1,553 miles).

HEIGHT RECORD

Light Aircraft, 3rd category (single seaters weighing less than 350 kgs.), Altitude (France). Albert monoplane fitted with 80-88 h.p. Genet engine at Le Bourget, February 11th, 1930, 7,730 metres.



The 80-88 H.P. 5-CYLINDER GENET is the lightest light aeroplane engine in its class. There is no more robust, economical and reliable light engine in the world.

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Antwerp run, and we elected to return on it. By this means we saw the Exhibition from the air three times,—which is another story.

M. Jude set out successfully from the aerodrome at Deurne with us, and we admired the exhibition before settling down really comfortably for the journey. Those Fokkers are very comfortable, and four out of the eight chairs have high backs. We were admiring the interested school children in a playground and had, in fact, just waved back at them when the engines ceased their clamour and we began to glide. There was no vestige of a landing in sight, so our interest was reaching a high pitch when they started up again and the plane swung into a turn which continued for 180 degrees.

Seeing an anxiously inquisitive face at the window behind him, M. Jude smiled and stuck up three fingers, wiggled the middle one and folded it down,—a most graphic indication of the failure of the nose engine. One then noticed that the middle throttle was right back. The outboard engines were still going strong, however, and the machine climbed to 400 metres on the return trip.

Arrived at Antwerp once again, we learned that one of the cylinders had blown off a piece of exhaust pipe, and although this is not dangerous the pilot had throttled all three until he found which was at fault and then continued on the other two.

Less than an hour later a similar machine arrived from Brussels and we saw the Exhibition for the third time. Belgium is not properly designed for forced landings, we decided meditatively while flying low over tiny fields, each one with its fringe of trees. Fortunately the revolution counters never wavered. Over England an hour later we blessed the custom of primogeniture, whereby the estate goes undivided to the eldest and condemns the younger sons to manage colonies or businesses. It is hard on the outcasts, but at least the land retains spacious fields, bordered by hedgerows, not trees, and of a green unspeakably beautiful on a sunny Spring evening.

A FEMININE VIEW.

BY JOAN BRADBROOKE.

Flying from London to Antwerp by *Sabena* is a delightful experience, at least I found it so, when, on going over to the International Exhibition at Antwerp last Tuesday, I decided to take advantage of Sabena's direct London to Antwerp service, leaving London at 9.20 in the morning.

The plane, a tri-motored Fokker, was extremely comfortable, with six chairs, upholstered in leather, four facing frontwards and two backwards, with room for two more to be put in at the back. The temperature of the cabin can be regulated. The door into the pilot's cockpit is closed in, except for a pane of glass at the top which enables the curious to see what the pilot is doing.

Before taking off, passengers are furnished with Wrigley's chewing gum and cotton wool—the gum to be chewed to prevent air sickness, the wool to shut out the roar of the engines from one's ears, as some people have found that they are deafened by the roar. Personally, I dispensed with both, having a horror of chewing gum and no intention of being air-sick. Also, to me, there is something rather sweet in the roar of those three engines, doing about 1,600 revs. each—I know because the rev. indicator is so placed on the two side engines that one can see them from the cabin.

In the cabin they also provide an altimeter and a clock, for the passengers.

Precisely at 9.20 we took off from Croydon. Visibility was not any too good. The clouds were fairly low and it was quite misty. I had a map of sorts and was able to follow our route as far as Dunkerque, on the coast of France.

In a surprisingly short time we had passed over Biggin Hill, two or three railroads, Hawkinge Aerodrome, and there we were over Dover. I have driven through quite a lot of the English country but have quite decided that it is only by flying over it that one really appreciates it. It is so very green and rolling—the downs and the little villages with here and there an ugly red brick modern one.

Before I realised it we were out over the Channel, and all I could see of Dover, which was fast disappearing in the mist, was the white cliffs. Over the Channel visibility was decidedly poor. I could see the sea directly below me but apart from that nothing except a few ships crawling along.

I think what impressed me most was the height at which we flew—it was so low. It was my first experience of flying with three engines. Always before there has only been one and we have always been up at least two or three thousand feet for safety. Apparently with three engines this is not necessary, because on looking at the altimeter I discovered it only registered two—what—I realised it could not be two hundred feet because I knew we were not as low as that and then I realised—metres, being a French plane—or rather, Belgian.

All the way across the Channel and Belgium we flew between 100 and 200 metres up. Personally I prefer it to being higher. There is much more fun in being so low down, although rather unfair to the people on the ground. We can see so much more of their houses and lands than from the road or from a greater height.

Out of the mist appeared Calais and from there we flew for miles right along the coast—looking down on the sand from my side, and on the other into the sea. I was the only passenger that morning so was at liberty to wander from one side to the other. Once the pilot turned round and motioned downwards and then made movements with his arms as of a person swimming. All this of course through the glass in the door, which, according to regulations, is kept closed. I looked down and there were people swimming, although it did not appeal to me as an ideal day for it.

Finally we turned in off the coast and headed inland. What struck me most when flying over Belgium was the difference in the country itself from England, and the animals. The fields were so much smaller and so uniform in size, the roads so straight and so few trees—the only ones I could see were the Lombardy poplars along the roads; also the country was so very flat.

As for the animals, they were too ridiculous. Cows standing peacefully in fields would suddenly raise their heads and career wildly round the field. Quite different from the English cows who were simply not interested in us, no matter how much noise we made nor how low we flew.

I divided my time between the country and getting up and peering into the pilot's cockpit. He had many instruments that I couldn't make head nor tail of, although I did discover the three controls for his engines, also his wireless which he was using every once in a while—keeping in touch with the Control-Tower. Also, by dint of craning my neck I discovered his air-speed indicator. Here again I had to realise that it was kilometres instead of miles. I worked this out because I knew that the cruising speed of a Fokker is about 90 miles, and his indicator showed between 120 and 140 all the way. Therefore kilometres, as it simply couldn't be miles.

The pilot seeing me peering in smiled and held up his map to show me where we were, then, as we ran into rain and very low clouds, turned back to his controls again, and I retired to my seat, where in between breaks in the clouds I caught sight of windmills and canals and peasants waving frantically, and those silly cows.

Just before we reached Antwerp it cleared again. My map did not go as far as Antwerp, so I was hopelessly lost but the pilot turned round and pointed down again, and on looking down I discovered we were passing over a large city and rapidly losing what little height we had. We made a perfect landing on a not too good field and exactly 2 hours and 10 minutes after we left London we were in Antwerp and I was attempting in terrible French to make people understand that I had nothing to declare.

Certainly, though, it was by far the most pleasant trip of any kind I have ever made. So comfortable, such a steady machine, and, although the roar of the engines can be heard, I had my windows open, and on arriving my ears were perfectly all right. Also, although it has been suggested that in passenger machines the pilot's cockpit should be completely shut off so that passengers can not see what he is doing, I hope they leave it the way it is. It's so much more interesting.

THE KING'S CUP AIR RACE.

Intending competitors are reminded that entries for the King's Cup Air Race close on Friday, June 6. Late entries will be received up till noon, Friday, June 13, at a fee of £10.

Competitors will help the Royal Aero Club very much if they will send in their entries at the earliest possible date.

The Committee of the Royal Aero Club has approved the following additional prizes for the King's Cup Race:

A Cup presented by the *Evening World* Newcastle-on-Tyne and cash prizes of £60, £30 and £10 to the three competitors who make the best handicap time between London and Newcastle-on-Tyne.

A Challenge Cup presented by Mr. J. D. Siddeley and a cash prize of £50 presented by Mr. M. H. Volk. Open to Light Aeroplane Clubs only.

BUSINESS ENTERPRISE.

On May 26, about 18.30 hrs., Mr. Wood, the London Manager of A. V. Roe and Co. Ltd., was called upon the telephone by the firm's agent in Brisbane, Queensland. This must be the first use of the new beam-radio system in the Aircraft Industry. Mr. Wood says that the transmission was quite as good as that of the ordinary call between London and Manchester. Apparently the Brisbane agent must have been telephoning at about 02.00 hrs. next day.

But this adds a new terror to life. Our manufacturers in all trades will be liable to interruption at all hours. And there will never be a repetition of the historic case of the agent from Australia who, on arriving in England, said that he had come to get an answer to his cablegrams.

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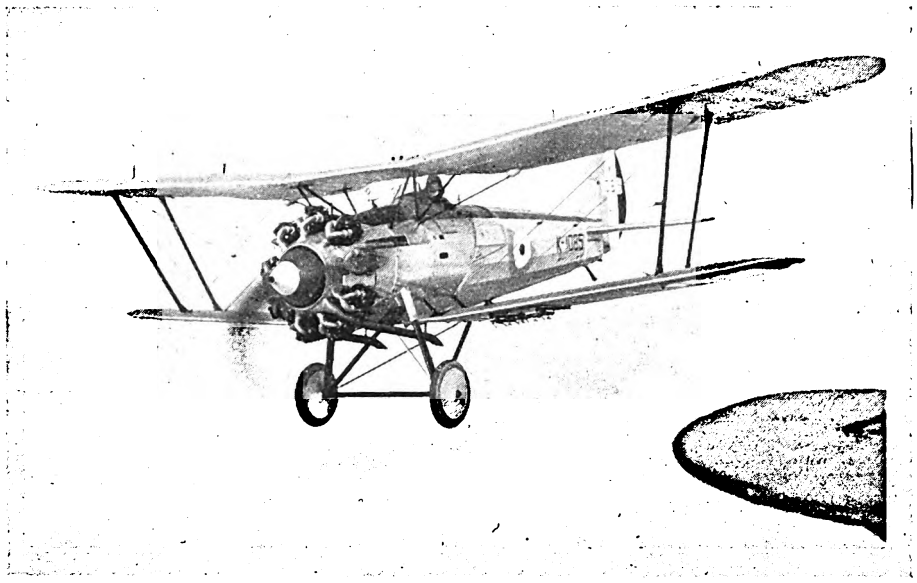

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A ROYAL OPINION.

In his opening speech at the Twelfth Congress of the Federation of Chambers of Commerce of the British Empire at the Guildhall on May 26, H.R.H. The Prince of Wales made the following reference to aviation.

According to *The Times* he said:—

I have been looking through the agenda of the conference, and I find that among the very interesting resolutions to be considered (many of which may result in no final agreement, but which will at any rate provide interesting food for thought pending the next congress) there is one topic which makes a peculiar appeal to me. This relates to communication by air. Aircraft does much to make the whole world kin and to lead to that community of thought among nations which is the best augury for the future peace and—with peace—confidence and prosperity of the world.

As you are aware, I have in my time done a certain amount of flying, and I hope to do a considerable amount more. While in Africa I have experienced to the full the boon flying can be in saving time and in shortening distances. We have all during the last few days been watching with the greatest interest a plucky single-handed attempt to shorten the distance between England and Australia, and I am sure that you will all join with me in congratulating Miss Johnson on her remarkable achievement.

THE PREMIER GOES BY AIR.

Mr. MacDonald and Miss Ishbel MacDonald flew from London to Edinburgh on May 23. They left Croydon at 10.00 hrs. in an Imperial Airways Argosy (three Jaguars) with ten other passengers. The route was by way of Manchester, where the aeroplane landed on the municipal aerodrome, and a civic reception was given to the Prime Minister. Turnhouse Aerodrome was reached at 15.30 hrs.

THE WILBUR WRIGHT MEMORIAL LECTURE.

On Friday, May 30, at 18.30 hrs., the Eighteenth Wilbur Wright Memorial Lecture will be delivered by Mr. H. R. Ricardo at 18, John Street, Adelphi, W.C.2. The subject of the lecture will be the Development and Progress of the Aero Engine. Visitors will be welcome.

THE "GRAF ZEPPELIN" CROSSES THE LINE.

On the evening of May 22 the *Graf Zeppelin* reached Pernambuco, having left Seville on May 20 in the early morning. This is the first time an airship has flown the South Atlantic, and the first time, in spite of her many voyagings, and her trip round the world, that this ship has crossed the Line. Many newspapers have stated in error that the *Graf Zeppelin* is the first airship to cross the line. As a matter of fact a Zeppelin which started from Bulgaria in March, 1918, with stores for General von Lettow-Vorbeck in German East Africa, crossed the Equator and returned safely, though unhappily without reaching its objective, as the captain was informed by radio that the German forces had already surrendered.

The *Graf Zeppelin* also acted for the first time as the sea-link in the Luft Hansa and Kondor chain of air routes from Berlin to Buenos Ayres and other South American cities. The German mail was flown to Seville and put aboard the airship there.

The ship followed all the usual stepping stones across the ocean, the Canaries, the Cape Verde Islands, where a bag of mail was dropped by parachute over Praia, St. Paul's Rocks—where some day somebody will build a seaplane station,—and Fernando Noronha.

The *Graf Zeppelin* is insured on a value of £160,000, one quarter of which is uninsured (that is to say, the owners run the risk). The other three-quarters of the risk is covered in equal parts on the Continent and in London, where both Lloyd's underwriters and the insurance companies have underwritten the risk.

There is also a policy in existence under which the passengers can obtain cover against death and personal injury under the "travel ticket" system already in use for railway and steamer journeys. This is a comparatively new type of risk for the insurance market, and the premiums charged are necessarily high. For instance a passenger on R.100, who has been insured for the duration of the Atlantic trip, has had to pay a premium of £2 per £100.

On May 23 a mishap to the refuelling equipment, when a valve was damaged and a labourer slightly injured, delayed the start of the *Graf Zeppelin* from Pernambuco. She finally left at midnight and landed at Rio de Janeiro in the early morning of May 25. She had arrived over Rio shortly after midnight and hung over the town until dawn.

A strong headwind had reduced the average speed of the ship over the ground from Pernambuco to Rio to less than 43 m.p.h. Presumably this late arrival was the reason for the very brief visit of the airship, which, after a stay of less than two hours, left again for Pernambuco, which was reached in time for breakfast on May 26.

THE TRIALS OF R.100.

On May 21 R.100 once again was unkenneled and hung by her nose to the mooring mast at Cardington. In the evening at 19.00 hours she was loosed and flew southwards to London where she bobbed a curtsey to their Majesties the King and Queen who were going to the opera. Some controvert this story and say that the R.100 was saluting its own spiritual pastors at the Air Ministry.

Anyway, speaking for oneself as a dweller in the Metropolis, a sudden noise of many hundreds of horses all threshing the air impelled one to the roof and there forced one to confess that as a spectacle airships are well worth a million,—of someone else's money. The evening was perfect, so was the visibility, and R.100 glinting gold in a blue and pink sky made a marvellous picture.

The airship returned to the mast at 16.00 hrs. on May 22 after she had been away for 21 hours. In spite of her good behaviour, in spite of the fact that she cruised at over 62 m.p.h., that she flew at 70 m.p.h. for three hours and even flew for 10 minutes at 80 m.p.h., in spite of her wireless working perfectly or nearly so, yet she came home with her tail between her non-existent legs.

Airships have to have a perfect streamline shape, but as the gas is contained in balloons of a kind, there can obviously be no serious purpose in the pointed tail, not even a sting. The tail therefore is a fairing and so light that one understands that the R.100, shying at some sight which shocked her in the early hours, stepped back onto a cloud and bent her own tail.

The trip across the Atlantic has been postponed in deference to the request of the Canadian Government, whose Ministry of National Defence has asked that the arrival of R.100 at Montreal should not occur till after the rising of the Dominion Parliament at the end of May. The idea is that this will enable Ministers and other members to be free to greet the R.100.

ON THE CRUISE.

Those who were fortunate enough to travel in the Airship R.100 during her voyage on May 21 and 22 had an excellent trip. They left Cardington at 19.00 hours and headed for London at 1,500 feet. The weather was brilliant. Near London the airship was picked up by several Moths, one of which, a yellow one, presumably of the London Aero Club, proceeded to play about and do half rolls a couple of hundred feet away from the ship, which led one of the passengers to discourse on the need for aerial police and the question of flying to the common danger.

Circling round London the passengers could watch the obvious delight of the large crowds, watching "why their income tax etc." The North side of the River was very clear but smoke hung over the South side.

After leaving London the ship headed out to sea and circled round Southend where, from the air, the illuminations of the pier and Westcliff parade were very effective. *Shamrock V* and other yachts and a destroyer were lying off the pier at Southend, and the destroyer turned on her searchlights.

R.100 then headed out to sea and spent the night doing various tests with Wireless Telegraphy and Radio Telephony. The next morning she crossed the coast at 07.20 hours near Southwold at 2,000 feet and headed for Hull.

There were thick clouds everywhere and only occasional glimpses of land could be seen. The first landmark sighted was Sherburn-in-Elmet and just before 11.30 hours Leeds and Bradford came into sight. A course was set for Manchester which, thick and dirty with grime, was reached at midday.

From Manchester the ship went to Liverpool and thence to the Cheshire side and over Stoke-on-Trent. The course home was over Burton and Leicester and Wellingborough.

Conditions on board are described as having been excellent and several of the passengers admit that they are now converted to the airship as a *de luxe* method of travel.

During this cruise R.100 was commanded by Sq. Ldr. R. S. Booth, A.F.C. Other Officers on board were Sq. Ldr. E. L. Johnston, O.B.E., A.F.C., R.A.F.O., Capt. G. F. Meager, Lieut.-Comdr. W. H. Watt, R.N.R. (retired), and Flg. Off. M. H. Steff. The passengers on board included Sir Denistoun Burney and several of the heads of the design and constructional staff of the R.100, Mr. Montague (Under Secretary of State for Air), Sir Harry Brittain, Grp. Capt. A. V. Bettington, C.M.G. (Officer Commanding the Home Aircraft Depot, Henlow), Sq. Ldr. H. K. Thorold, D.S.C., D.F.C., A.F.C., (Directorate of Staff Duties Air Ministry), Sq. Ldr. M. L. Taylor, A.F.C. (School of Photography, R.A.F.), and a number of the technical *personnel* from the Air Ministry and the Royal Aircraft Establishment.

THE AIRSHIP PROGRAMME.

In the House of Commons on May 21 in reply to a question by Lt.-Cmdr. Kenworthy, the Under-Secretary of State for Air said that no decision had been or would be taken in regard to future airship construction policy pending further progress with the programme of experimental flights to be made by the R.100 and R.101. He could not see that he was called upon either to confirm or to deny newspaper reports. Probably the basis of the report which appeared in *The Daily Herald* that a great airship was to be built was that the Airship Guarantee Company had been given a designing contract by the Air Ministry to keep their technical staff in being, in the event of new construction being approved.

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Miss Amy
JOHNSON
on her great flight
to Australia in a
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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, May 20.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—The following are granted temp. comns. as Flg. Offs. on attachment for duty with the R.A.F. (May 11):—

LIEUTS., R.N.—Cecil Kenneth Ashwanden; James Arthur Laurence Drummond.

SUB-LIEUTS., R.N.—Gerald Donald Anderson; Thomas Walter Townsend Blackwell; John de Filek Jago; George Bodley Kingdon; Wilfrid Henry Gerald Saunt; William Gerald Williams.

LIEUT., R.M.—Nigel Robert Mackie Skene.

The following Plt. Offs. on probation are confirmed in rank (Apr. 28):—Derek Richard Charles Barrois de Sarigny; Charles Milsom Rees.

The following Plt. Offs. are promoted to the rank of Flg. Off.:—Wilfrid Sydney Charles Adams (Feb. 24); Francis Joseph St. George Braithewaite, and Robert Harston (Mar. 7); Harold Basset Collins, and Geoffrey Cuyler Holland (Mar. 28); Denis Hensley Fulton Barnett (Apr. 5); Frank Read (Apr. 8); Charles Richard John Hawkins, Michael Thomas Mary Hyland, and Brian Arthur Oakley (Apr. 12); Edward Gerard Granville, and Gershom Frederic Parkington O'Farrell (May 2).

Group Capt. Sacheverell Arthur Hebden, O.B.E., is placed on the retired list (May 17).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—Alan Moncrieff Maclachlan (May 5); Richard Whitelegge O'Sullivan (May 5). Plt. Off. James Paton is promoted to the rank of Flg. Off. (May 13).

Flg. Off. Charles Pakenham Vines is transferred from Class A. to Class C. (Apr. 4). (Substituted for the notification in the *Gazette* of Apr. 15.)

The following Flg. Offs. are transferred from Class B.B. to Class C.:—Alexander Robert John Savage (Mar. 24); Gerard Bowes Kingston James (May 2).

Flg. Off. William Newton Lancaster relinquishes his comn. on completion of service (Apr. 30).

Flt. Lt. Charles Fenn relinquishes his comn. on completion of service, and is permitted to retain his rank (Apr. 28). Flg. Off. James Edward Doran-Webb relinquishes his comn. on account of ill-health and is permitted to retain his rank (May 21).

MEDICAL BRANCH.—Flg. Off. Frank George Mogg is granted a comn. in the Special Reserve on resignation of his comn. in Class D.D. (Mar. 4).

Flt. Lt. James Burgess Woodrow relinquishes his comn. on completion of service (Apr. 24).

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 604 (COUNTY OF MIDDLESEX) (BOMBER) SQUADRON.—Lt.-Col. Alan Sidney Whitehorn Dore, D.S.O., to be Sq. Ldr. (Hon. Wing Cdr.) and to command the Sqdn. (Mar. 19).

The following to be Plt. Off.:—Abraham Eyre Chatterton (Mar. 19).

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—Plt. Off. Sydney John Huins relinquishes his comn. on account of ill-health and is permitted to retain his rank (Apr. 24). (Substituted for the notification in the *Gazette* of May 6.)

Appointments.

Week ending May 26.

GENERAL DUTIES BRANCH.—Squadron Leaders H. A. Whistler, D.S.O., D.F.C., to C.F.S., Wittering, 12/5. W. B. Everton, to R.A.F. M.T. Depot, Shrewsbury, 7/5. E. J. D. Routh, to No. 29 Sqdn., North Weald, 2/5. V. R. Gibbs, D.S.C., to H.Q., R.A.F., Transjordan and Palestine, 15/4.

Flight Lieutenants C. A. B. B. Wilcock, A.F.C., to H.Q., 'Iraq Command, instead of to Armoured Car Wing as previously notified, 29/3. G. V. Howard, D.F.C., to No. 4 F.T.S., Egypt, 1/5. E. D. M. Hopkins, to A. and G. School, Eastchurch, 17/4. A. J. Holmes, to R.A.F. Depot, Uxbridge, 17/4.

Flying Officers M. J. Du Cray, to Aircraft Depot, Hinaidi, instead of to No. 84 Sqdn., as previously notified, 29/3. C. P. Ashton-Jinks, to H.A.D., Henlow, 17/4. B. G. Farrow, to Aircraft Depot, India, 19/4. I. B. Beesley, to C.F.S., Wittering, 20/5. H. J. A. Williams, to No. 31 Sqdn., India, 10/4. R. J. Legg, to No. 604 Sqdn., Hendon, 19/5. D. T. Saville, to No. 207 Sqdn., Bircham Newton, 19/5. S. L. Blunt, to R.A.F. Depot, Uxbridge, 12/4. F. Read, to No. 25 Sqdn., Hawkinge, 13/5.

Pilot Officers F. A. McNeill, to No. 30 Sqdn., 'Iraq, instead of to No. 55 Sqdn., as previously notified, 29/3. R. P. Cauthery, to No. 27 Sqdn., India, 9/4. H. M. B. Collins, to No. 60 Sqdn., India, 9/4. C. E. Hartley, to Aircraft Depot, India, 9/4. C. S. Millar, to No. 11 Sqdn., India, 9/4. H. B. Robertson, to No. 70 Sqdn., 'Iraq, 10/4.

STORES BRANCH.—Flying Officers J. E. Welman, to H.A.D., Henlow, 25/4. A. A. Quayle, to Aircraft Depot, India, 16/4.

The Prince of Wales.

On May 21 H.R.H. the Prince of Wales flew from Hendon to Cardiff, to appear at a public function, in a Service Westland Wapiti piloted by Sq. Ldr. D. S. Don, M.V.O. The journey took just over an hour and the machine alighted on the new Cardiff Municipal Aerodrome.

The return journey between Cardiff and the landing ground in Windsor Great Park took one hour.

R.A.F. Action on the North-West Frontier.

The Secretary of State for India in the course of a statement in the House of Commons on May 14 said that in the Peshawar District on the borders of the Mohmand country, after the air action taken on May 11 against the Haji of Turangzai, the inhabitants of certain villages in British territory which had been in communication with the Haji had been disarmed by frontier constabulary supported by troops. Several leaders had been arrested.

The lashkar collected by the Haji's son had been attacked by the Royal Air Force again on the 12th.

In Northern Waziristan on May 11 a Waziri lashkar some 400 strong had attacked the Tochi Scout Post at Datta Khel. One scout sepoy had been killed. The Royal Air Force had attacked this lashkar, but desultory firing on the Post had continued during the night of the 11th.

On the 12th the lashkar had been reported to be dispersing, and no further action had taken place. On the night of the 12th however Datta Khel Post had again been attacked and air action had again been necessary on May 13.

A *Reuter* message from Peshawar on May 20 states:—

Badshah Gul, son of the Haji of Turangzai, has been wounded as the result of bombing, and it is reported that he has been removed from the Border.

The Times correspondent in Lahore in a message dated May 22 states:—

Details are now available of how Flying-Officer Stroud and Aircraftman Wiltshire were killed in the Khyber Pass on Saturday.

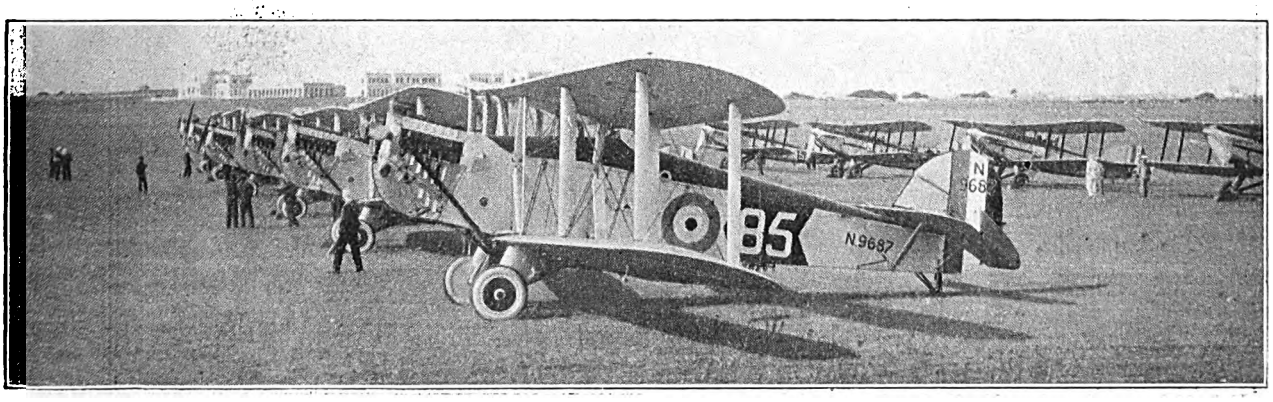
Flying-Officer Stroud had been bombing hostile tribesmen and came down to 600 feet, so that Aircraftman Wiltshire, his observer, might use the machine-gun. While flying at this height, Flying-Officer Stroud was hit by a bullet from the ground which lodged in his neck. He signalled to Wiltshire to take control and then died.

Wiltshire, who had had no experience of flying, fitted in a spare lever in the control-column in the back seat, turned the machine, and made for the emergency landing-ground, 45 miles away. He succeeded in reaching his objective, but, from lack of experience, landed too fast and crashed. He died in hospital the same night.

Wiltshire could have jumped with a parachute, but, no doubt thinking that the pilot was still alive, chose the hazardous course of returning to the aerodrome.

Air Operations in Transjordan.

News has just been received that a recrudescence of trans-frontier raiding between Transjordan and Nejd tribes occurred during March. With the object of arresting the offenders and putting a stop to further raids, a force consisting of two troops of Transjordan Frontier Force in motor transport, six aircraft of No. 14 (Bomber) Squadron,



FLEET CO-OPERATION.—A flight of Blackburn Darts (Napier Lion) (Fleet Torpedo Bombers) and a Flight of Fairey III.Fs (Napier Lion) Fleet Spotter Reconnaissance) at the R.A.F. Display at Malta on May 10. The new buildings of the Hal Far Aerodrome are in the background.

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Miss Amy Johnson's

remarkable

LONE FLIGHT

TO AUSTRALIA

Following the Duchess of Bedford's record flight to Capetown and back, Miss Amy Johnson, the 26-year-old lady pilot, has flown her Gypsy Moth single-handed from Croydon to Australia in 20 days. During her journey Miss Johnson beat the existing record for a solo flight to India by reaching that country in 6 days.

Miss Johnson chose "Summer Shell" petrol and her great achievement is still further proof of Shell's supremacy.

SUMMER SHELL PETROL

now on sale

AT EVERY "SHELL" PUMP

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III.Ds appeared in "V" formation from Calafrana and gave a demonstration of changing formation over the aerodrome before returning to their base. A correspondent in Malta says that their manœuvring was "wonderful for such 'Post-Trafalgar' air-taxis."

The next event was a display of Flight Aerobatics by three Fairey Flycatchers. They took off in flight formation and turned with a "Prince of Wales' Feathers." They then crossed the aerodrome in line abreast and turned again by half-rolling. This was followed by various Flight Aerobatics including spirals, looping and rolling off the top of a loop in line astern.

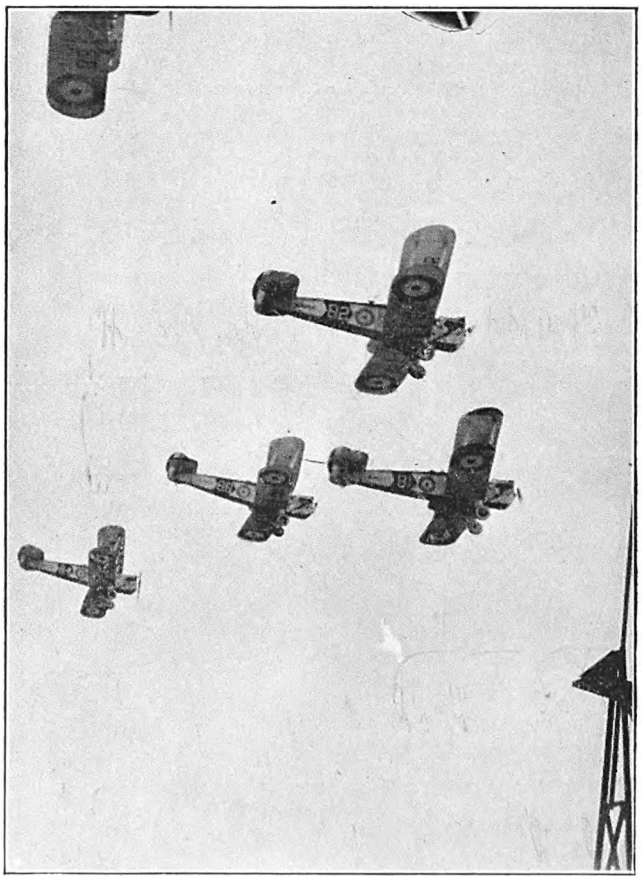
After this all the Units took off for Wing Formation Flying, a display which was on the whole very good although one or two machines got a little out of position.

After the tea interval two Flycatchers fought a Fairey III.F. One of the Flycatchers was soon brought down and disappeared behind the cliffs with the usual clouds of smoke. The other made determined efforts to demolish the III.F single-handed and performed every kind of manœuvre known to air fighting. During one of these spectacular turns the pilot, to the consternation of the spectators, fell out of the machine and in spite of the prompt opening of his parachute, bounced many feet into the air on hitting the ground. He turned out to be a relation of Major Sandbags of Hendon fame.

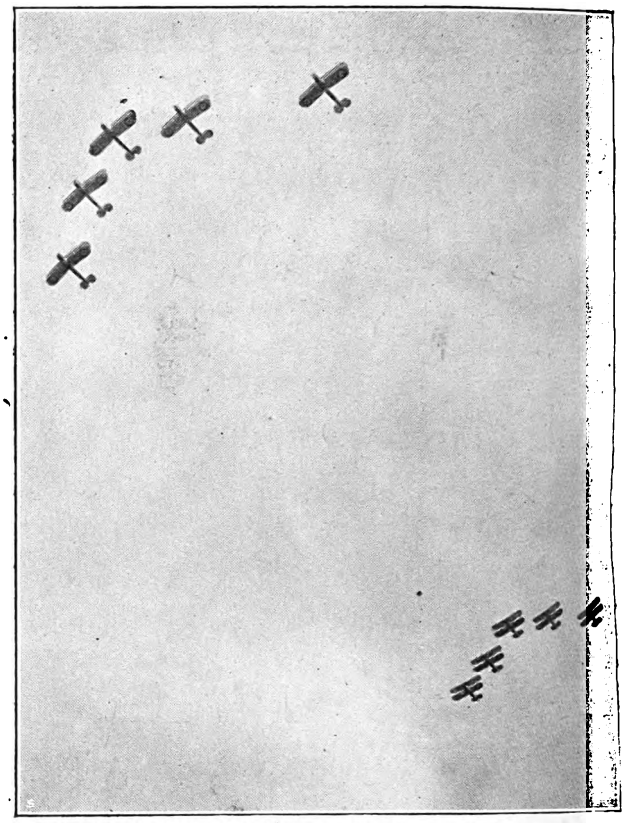
A curious looking object like a black tank had appeared in the middle of the aerodrome during tea-time. This was next attacked by the Flycatcher Flight which dived on it from all angles dropping bombs. The first bomb was almost a direct hit and bomb after bomb splashed around the target. The attackers roared by at full throttle and disappeared as suddenly as they had come. What was left of the tank was rescued by a party of aircraftmen one of whom became entangled in something and fell into it. Fortunately his remarks were inaudible.

The Set Piece represented an enemy oil refinery in Ruritania. First a Spotter flew round it and was fired at by the Ruritanians with what appeared to be a high-elevation cannon. They were congratulated on their rapid fire. The Spotter, finding things too hot, called for help and was promptly answered by a Flight of Fighters which made a machine-gun attack which caused the Ruritanians to scatter in panic.

The Big Man of the oil wells got into his car and drove towards the enclosures, the Fighters in hot persuit. They missed the car and the spectators by what seemed to be a few feet and, according to our Malta correspondent, "zoomed up at full bore emitting split-blue noises." Then the Blackburn Darts arrived and demolished the factories of Ruritania with their first volley of bombs.



FLIGHT FORMATION.—A Flight of Blackburn Darts (Napier Lion) taking-off in formation at the R.A.F. Display at Malta.



WING DRILL.—Blackburn Darts and Fairey Flycatchers in the Wing formation display at Malta.

Although this ended the official part of the programme, two of the Flycatchers had become well warmed to the occasion and proceeded to give a very lively display of flying including looping together, the strong wind allowing this to be done unusually low down.

The mass of cars dispersed easily under the able and well-organised control of the R.A.F. personnel. The whole Display was extremely well organised and went without a hitch. The massed bands of H.M.S. *Royal Sovereign* and H.M.S. *Eagle* played during the afternoon.

The R.A.F. Ensign Afloat.

New regulations to be observed with regard to the flying of the R.A.F. ensign by flying-boats and R.A.F. marine craft are contained in a recent Air Ministry Order. King's Regulations and Air Council Instructions will be amended as necessary in due course. The new Regulations read:—

Flying-boats.—(i) The ensign will be flown in foreign waters only. (ii) The ensign will be flown only when the aircraft is at moorings. (iii) The 4 ft. by 12 ft. ensign will be used. (iv) The ensign will be flown from the most suitable position, according to each type of flying-boat. In the Southampton and Iris types the method by which the halyards for the ensign are secured from the trailing edge of the top centre section by means of a small pulley and a cleat or eye bolt in a rib of the bottom centre section (thus enabling the ensign to be hoisted or lowered quickly from the port after cockpit) is considered the most suitable and convenient.

R.A.F. marine craft.—The ensign (4 ft. by 2 ft.) will be flown (from an ensign staff in the stern) on the following occasions:—(i) When in foreign waters. (ii) In British waters:—(*a*) when outside territorial waters (day only); (*b*) when proceeding on extended coastal cruises, though not outside territorial waters (day only); (*c*) when H.M. ships are dressed (day only); (*d*) when going alongside a foreign warship or aircraft (day and night); (*e*) when flying in the bows one of the special flags referred to in Art. 112 of King's Regulations and Admiralty Instructions.

R.A.F. Staff College.

The following officers passed the R.A.F. Staff College examination which was held in March, 1930. Selection to attend the Staff College will be made from among these officers and from those who passed in 1929, but were not selected for the 1930 course:—

Flight Lieutenants G. C. A. Armstrong, D. G. Banting, J. C. Barraclough, G. W. Birkinshaw, H. G. Brookman, G. Coombe, R. Darvel, J. MacG. Fairweather, F. F. Garraway, H. N. Hampton, W. M. M. Hurley, R. Ivelaw-Chapman, and A. H. Love.

Squadron Leader P. E. Maitland. *Flight Lieutenant* P. L. Plant. *Squadron Leader* H. B. Russell. *Flight Lieutenants* W. J. Seward, R. H. S. Spaight, C. H. Stilwell, A. E. Sutton-Jones, W. P. Theak, H. N. Thornton, G. H. Vasse, A. R. Wardle.

Squadron Leaders H. A. Whistler, H. E. Wigglesworth.

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The Armorial Bearings of the R.A.F. College, Cranwell.

The Royal Air Force College, which was founded in 1920, has now followed the example of the other Naval and Military Colleges throughout the Empire, and has adopted Armorial Bearings peculiar to the College and, with the assistance of the College of Heralds, heraldically correct. Hitherto the College has had to be satisfied with a symbol, a Garter and a Legend, which had no true heraldic character and was often assumed, wholly or in part, by other Units of the Service.

Before submitting any proposals to the College of Arms the Staff of the College decided to explore the ancient history of Cranwell. This exploration did not divulge any definite information about the meaning of Cranwell but the village appears as Cranewell in Domesday Book. A family named de Cranewell owned land there in the XIIth Century, presumably taking its name from the place. Mention was found of this family, whose name is variously spelt, in the records of the XIIIth, and XIVth Centuries (*Finales Concordiae*) as follows:—1199 Humphrey de Cranewell; 1202 Robert de Cranewel; 1223 Walter de Cranewell; 1247 Alan and William de Cranewell; 1250 Roger, son of Alan de Cranewel; 1263 Adam de Cranewel; 1271 William, son of Adam de Cranewel.

Further references to the family were found in *Feudal Aids* which read as follows:—

In 1303 William de Cranewel held land in Kirkby (Laythorpe) and Everdon (Evedon). Alan de Cranwel held half a knight's fee of the Templars in Cranwell. In 1346 Adam de Cranewel had succeeded William de Cranewel at Kirkby and Evedon. In 1428 William de Cranewel held half a knight's fee at Cranwell but there was no evidence of a Cranwell Coat of Arms. However about 1640, in the east window of the chancel of Cranwell Church, Gervase Holles found gules, 3 bars argent, a label of 3 points azure. impaling gules, 3 cranes argent (Crane-well) and an inscription:—"*Orate Specialiter pro animabus Willelmi Cranwell Armigeri et Margaretæ consortis suæ,*" from which it seemed fair deduction to assume that there was a Cranwell heiress at that day, who on marriage impaled her arms with those of her husband, and that the inscription referred to a previous bearer of the Cranwell Arms in the male line.

As there is no trace of the Cranwell Arms at Cranwell Church to-day this disclosure by Holles is especially fortunate.

These records gave the inquirer a historical foundation which seemed at once plausible, in that this coat included three birds (and three birds notable for long-distance flights). These birds were originally, in heraldic parlance, "Close," which is to say with their wings at their sides, but it seemed fair to render them as "Volant" on the College Coat typifying the three Squadrons that may soon be formed at Cranwell.

In choosing the colours of the Coat the true and original manner of heraldry was followed, and simple, suitable, and distinctive colours were chosen. The field and ground of the College Shield is azure, or heraldic blue, typifying the sky, the chief field of action of the R.A.F. For heraldic reasons it was necessary that the field should be overlaid with some charge and most appropriately with a chevron. The Royal status of the College made it necessary to find a place for the royal lions shown in red and gold. Therefore the three cranes are divided by a chevron *argent* bearing three golden lions.

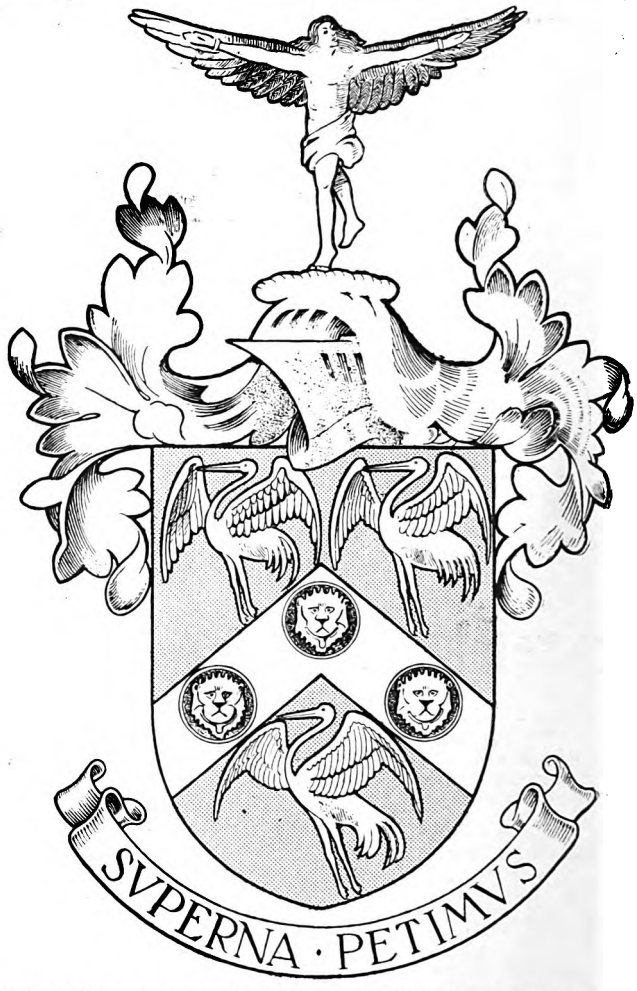
Regarding the question of the legend and the crest, in early days the crest was worn on the helmet, though in some bearings it is unexpectedly large; the coat was worn on the shield, the surcoat and the flag. The legend appears underneath the crest or the coat.

The R.A.F. College had already possessed for some years the legend *Superna Petimus*, probably to be attributed to a former Chaplain, the Rev. B. W. Keymer. For the crest itself the figure of Daedalus seems appropriate, not merely because, despite the exaggerations of the story, he was probably a historical figure who made the earliest recorded attempt at bird flight during the high days of the Cretan civilisation in 1200 B.C., but also because H.M.S. *Daedalus* was the name which Cranwell bore when it was first opened by the Admiralty as a station of the Royal Naval Air Service during the War 1914-18. The crest is therefore Daedalus standing proper on a wreath of two colours. The helmet and mantling are formal completion of the Arms.

The Warrant for the Arms from the College of Heralds reads:—

To ALL AND SINGULAR to whom these Presents shall come Sir Henry Farnham Burke, Knight Commander of the Royal Victorian Order, Companion of the Most Honourable Order of the Bath, Garter Principal King of Arms, Arthur William Steuart Cochrane, Esquire, Member of the Royal Victorian Order, Clarenceaux King of Arms, and Gerald Woods Woolaston, Esquire, Member of the Royal Victorian Order, Norroy King of Arms, send greeting:

WHEREAS Air Vice-Marshal Frederick Crosby Halahan, Companion of the Most Distinguished Order of Saint Michael and Saint George, Commander of the Most Excellent Order of the British Empire, Companion of the Distinguished Service Order, Member of the Fifth Class of the Royal Victorian Order, Commandant of the Royal Air Force College situate at Cranwell in the County of Lincoln hath represented unto The Most Noble Bernard Marmaduke, Duke of Norfolk, Earl Marshal and Hereditary Marshal of England, That by the Air Force Constitution Act of 1917 the Royal Air Force was constituted as a separate establishment with an Air Council and such



staff as they might require That on the Fifth day of February One thousand nine hundred and twenty the Royal Air Force College was created for the purpose of training its own Officers for the said Royal Air Force with a Commandant and a Staff in charge of the said College That a permanent site for the said College has now been purchased at Cranwell in the said County of Lincoln That the Commandant and Staff of the said College are desirous of having fit and proper Armourial Bearings granted and assigned to be borne and used for the said College he therefore as Commandant requested the favour of His Grace's Warrant for Our granting and assigning such Armourial Bearings as may be proper to be borne and used for the said Royal Air Force College on Seals, Shields, Banners or otherwise according to the Laws of Arms AND FORASMUCH as the said Earl Marshal did by Warrant under his hand and Seal bearing date the Third day of December instant authorise and direct Us to grant and assign such Armourial Ensigns accordingly KNOW YE THEREFORE that we the said Garter Clarenceaux and Norroy in pursuance of His Grace's Warrant and by virtue of the Letters Patent of Our several Offices to each of Us respectively granted do by these Presents grant and assign the Arms following for the Royal Air Force College that is to say:—*Azure on a Chevron between three Cranes volant Argent as many Torteaux each charged with a Lion's face Or and for the Crest on a Wreath of the Colours A Figure representing Dædalus proper as the same are in the margin hereof more plainly depicted to be borne and used for ever hereafter for the said Royal Air Force College on Seals, Shields, Banners or otherwise according to the Laws of Arms* IN WITNESS whereof We the said Garter Clarenceux and Norroy Kings of Arms have to these Presents subscribed Our names and affixed the Seals of Our several Offices this Nineteenth days of December in the Twentieth year of the Reign of Our Sovereign Lord George the Fifth by the Grace of God of Great Britain, Ireland and the British Dominions beyond the Seas King Defender of the Faith etc. and in the Year of Our Lord One thousand nine hundred and twenty-nine.

Compressed-Air Flying.

A pilot who has done much flying in the Middle East has been reminded by the publication of the photograph of an Air Force machine on the landing ground at El Lisan, on the shores of the Dead Sea, of his personal experiences there.

The density of the atmosphere over the Dead Sea, which is about 1,000 feet below sea level, had quite a curious effect on both aeroplanes and engines. In the first place the engine itself produced an extra 250 r.p.m. from nowhere in particular, probably because the extra atmospheric pressure acted as a mild supercharger. The stalling speed of the machine was reduced by quite ten miles an hour, because of the density of the air, and the top speed was increased by about the same amount, presumably because although the denser air would tend to slow the machine the supercharging of the engine and the extra r.p.m. gave the extra power needed. He says that the machine landed like a feather.

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The suggestion had been made that the august department of the Air Ministry commonly known as Works and Bricks might arrange to have supplies of Dead Sea atmosphere transported to all the Flying Training Schools, something on the lines of the Scottish motor-cyclist living in London who used to go down to Brighton on his motor-bicycle on Sundays, deflate the tyres while there, pump them up again with Brighton air and release it in the hall on his return home for the benefit of his family.

Transfers to the Reserve.

The following officers, serving on short service commissions, become due, on the dates stated, to transfer to the Reserve or (where indicated by a star) to relinquish their commissions on the completion of their service on the active list of the R.A.F.:—

Flight Lieutenants C. Walter (July 1), *R. E. B. Rose (July 9), *C. W. Croxford, D.S.C. (July 14), *P. I. V. Rippon (July 18), C. W. Coffey, L.R.C.P. and S. (Aug. 24), R. A. Seaton (Sept. 1), G. T. O'Brien, L.R.C.P. and S. (Sept. 8), H. N. Hawker (Sept. 14), *G. N. Carroll (Sept. 15), P. S. Mumford (Sept. 19).

Flying Officer (Hon. Flight Lieutenant) *G. Anderson (July 14).

Flying Officers J. W. Busteed, G. P. Butcher, H. A. S. Byrne, H. V. Crowder, C. A. C. Patton, E. C. L. Richardson, W. L. Robertson, W. J. M. Spaight, R. C. Whitle (July 7); T. B. Fenwick (July 9); G. H. W. Selby-Lowndes (July 14); P. E. Grenfell, A. E. Hill, J. C. Lewis, A. W. Whitta, R. A. Wills, F. G. S. Wilson, J. N. Young (July 18); *K. C. Garvie (July 20); G. V. T. Thomson (July 27); A. P. Wayte (Aug. 5); L. F. Caunter, E. J. Fishenden, C. P. Marshall (Aug. 10); J. E. Welman (Aug. 14); L. C. Barling, A. M. N. David, T. O'N. East, H. A. Howes, W. F. Lovering, R. C. H. Monk, E. G. L. Russell, A. W. Shaw, E. A. Swiss, E. M. Thompson (Sept. 12); C. R. Mason (Sept. 14); *R. Mundy-Cox (Sept. 16); J. H. Leach, D. G. K. Walker (Sept. 21); W. E. Barnes, J. F. Lawn, H. G. Loch, W. C. McNeil, L. H. Mason, R. T. Read, G. L. G. Richmond, L. G. Rumsey (Sept. 26); F. G. Downing, K. Garston-Jones, S. H. White, W. L. Whitlock (Sept. 28); F. F. Barrett, E. A. T. Murray (Sept. 30).

Extension of Reserve Service.

The service of the following officers of the Reserve has been extended for five years:—

CLASS A.—*Flying Officers* W. Armstrong, A.F.C., E. E. Fresson, R. H. Lemon.

CLASS C.—*Flying Officers* G. S. Brown, C. McL. Reid, A. R. J. Savage, R. E. Steggall.

CLASS B.B.—*Flying Officers* H. M. Samuelson, E. M. Stewart.

The service of the following officers has been extended for four years:—

CLASS A.—*Flight Lieutenants* M. D. Barber, J. H. Bentham, N. H. Jay. *Flying Officers* A. D. L. Carroll, H. L. Christie, C. R. Stewart, L Whitfield.

The service of the following officer has been extended for two years:—

CLASS A.—*Flying Officer* H. D. Morley.

The service of the following officers has been extended for one year:—

CLASS A.—*Flight Lieutenant* A. F. Marlowe. *Flying Officer* H. E. Greenberry.

CLASS B.B.—*Flying Officer* A. Gillespie.

The Employment of R.M. Officers.

The attention of Commanding Officers is called in Admiralty Fleet Orders to the importance of taking advantage of every opportunity of employing R.M. Officers attached to the Fleet Air Arm on ordinary detachment duties in accordance with the conditions laid down in regulations.

Auxiliary Air Force Camps.

The annual training camps of the Special Reserve and Auxiliary Air Force will be held as follows:—

AUXILIARY AIR FORCE.

No. 600 (City of London) (Bomber) Squadron at Tangmere from Aug. 3 to 17.

No. 601 (County of London) (Bomber) Squadron at Lympne from Aug. 3 to 17.

No. 602 (City of Glasgow) (Bomber) Squadron at Leuchars from July 18 to Aug. 1.

No. 603 (City of Edinburgh) (Bomber) Squadron at Manston from July 13 to 27.

No. 605 (County of Warwick) (Bomber) Squadron at Manston from Aug. 3 to 17.

SPECIAL RESERVE.

No. 501 (City of Bristol) (Bomber) Squadron at Filton from July 27 to Aug. 9.

No. 502 (Ulster) (Bomber) Squadron at Aldergrove from July 13 to 26.

No. 503 (County of Lincoln) (Bomber) Squadron at Tangmere from July 20 to Aug. 2.

No. 504 (County of Nottingham) (Bomber) Squadron at Eastchurch from Aug. 3 to 16.

The other three Squadrons of the Auxiliary Air Force, No. 604 (County of Middlesex), No. 607 (County of Durham), and No. 608 (North Riding), have been formed so recently that they are not yet ready for camp training.

All the Units of the Auxiliary Air Force and Special Reserve are administered by No. 1 Air Defence Group which is commanded by Air Commodore W. F. MacNeece Foster, C.B.E., D.S.O., D.F.C., R.A.F.

Athletics in 'Iraq.

The R.A.F. ('Iraq) Athletic Championships were held on the Depot Sports Ground at Hinaidi on Mar. 28 and 29. The Individual Championships were held on the first day and the Team Championships on the second day.

In the Individual Championships the outstanding results were the success of AC. Thomas (Air H.Q.) who won the 100 yards in 10-2/5 seconds, and the 220 yards in 24-3/5 seconds, and AC. Frazer (55 Sq.) who won the 880 yards in 2 min. 12-4/5 secs. AC. Bishop's (30 Sq.) record of 5 ft. 7 in. in the high jump will probably remain unbeaten in 'Iraq for some time to come. Unfortunately jumping began too low for him and he was tired out before his biggest effort was required.

The old rivalry of the R.A.F. Championships at Uxbridge was revived in the Two Mile Walk between Sjt. Digby and AC. Rollinson. The latter after allowing his rival to take the lead, came through with a fine burst of speed and won as easily as he did in the Championships of 1927.

No. 55 (Bomber) Squadron won the Cup with 39 points, No. 30 (Bomber) Squadron were second with 34½ points, and No. 70 (Bomber) Squadron third with 21 points. The other scoring was "A" Squadron Air Depot 20, "D" Squadron 20, Armoured Car Wing 17, "B" Squadron Air Depot 14½, "C" Squadron Air Depot 10, Air H.Q. 7.

No. 55 Squadron won the Long Jump, the Two Miles Relay, the 360 yards Hurdles relay, and Putting the Shot.

The prizes were distributed by Lady Brooke-Popham.

"NIL NOS TREMEFACIT" (the Motto of No. 55 (B) Squadron, which may be interpreted, "You can't put the wind up Fifty-Five").—No. 55 Squadron Athletic Team which won the Championship of the 'Iraq Command. From left to right, back row: L-AC. Soper, L-AC. King, L-AC. Ryan, AC. Nicholas, L-AC. Cobbold, Cpl. Hunt (Trainer), L-AC. Martin, L-AC. Bicknell, Cpl. Trowbridge, Sjt. Edge, L-AC. Murray (Tug-of-War Team). Sitting: Sjt. Cox, L-AC. Glasscock, Sjt. Osmond, L-AC. Richardson, L-AC. Cargill, Sjt. Gordon, Plt. Off. Friday (Captain), Sjt. Gledhill, L-AC. Bazley, L-AC. Parker, L-AC. Morgan, L-AC. Cook, L-AC. Benwell. On the ground: L-AC. Cooper, L-AC. Frazer with the mascot.

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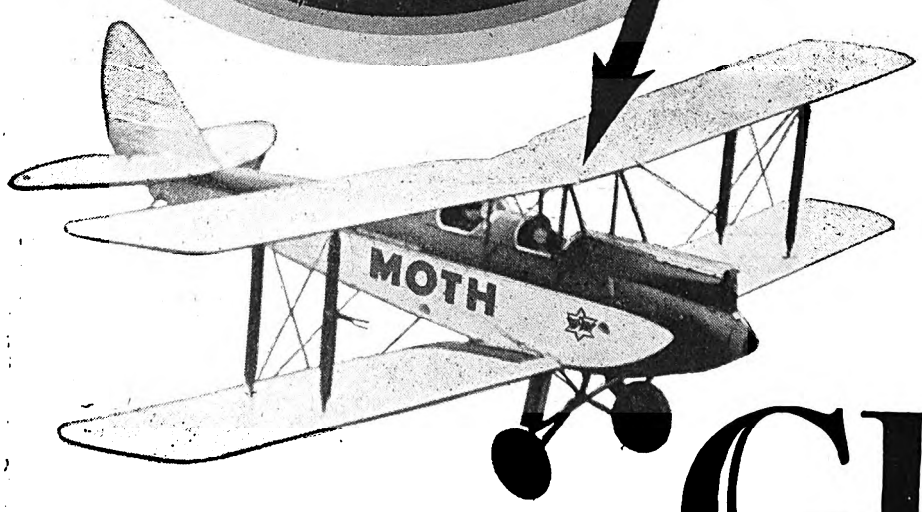

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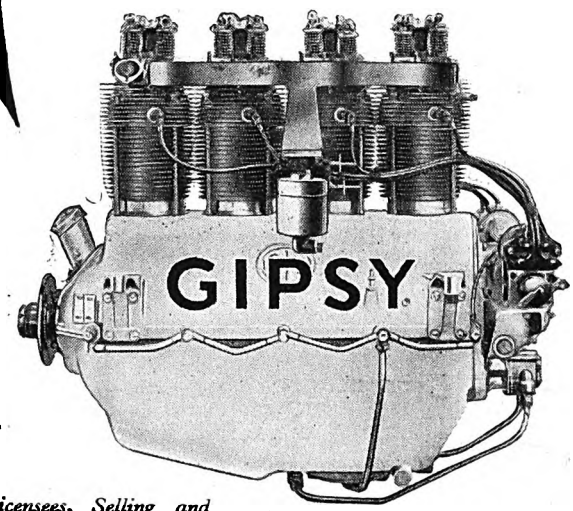

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AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

WHERE THE JUPITER ENGINE IS BUILT.

On May 21, a hundred or more privileged persons were invited to inspect the works of the Bristol Aeroplane Company Limited, at Filton, where the famous Mercury, Jupiter, and Lucifer engines are made. The occasion was not an anniversary of any kind. It was merely that an opportunity had arrived to show to those people who are chiefly responsible for the progress of British Aviation, the progress which the Bristol Company have been making of late in the production of their engines. So the party included technical people from the Air Ministry, heads of aircraft firms, producers of raw material and parts, and representatives of the newspapers,—a gathering in which lions, lambs, and mere beasts of burden, so to speak, lay down, or at any rate ate, together in perfect amity.

In the course of the past year, Mr. Roy Fedden, who is at once the originator, the designer, the production engineer, and to a very great extent, the chief salesman of the World-famous Jupiter engine, has been doing a large amount of re-organisation in the Jupiter works. Machinery has been moved and re-bedded in positions which will help the production-line. Partitions between one shop and another have been pulled down so as to give free movement of parts from one section of the factory to another. Stores have been centralised so that material is handed out in various directions without the people who transport the material falling over one another in alley-ways and passages.

A number of new processes of manufacture, or refinement of methods, have been introduced also in the last twelve months. And the result is that the Jupiter is still nearer being a perfect engine than it was twelve months ago.

Be it remembered, the Jupiter has now for several years been the most popular engine in the World, in that it is manufactured in more different countries than is any other aero-engine. Actually the Jupiter is being made under licence in seventeen countries, and last year the output of Jupiter engines by these various countries was somewhere about 1,200.

When you come to consider that the price of a Jupiter engine is about £1,500, you see that the value of these engines is close on two million pounds. In fact, when you take into consideration the parts which are made for use as spares, and are not actually sold as complete engines, the total output of Jupiter engines and parts must be considerably over two million pounds,—apart from the Titans which are becoming increasingly popular, and the new Mercury, which is likely to do big things in the near future.

This must be admitted by anybody to be a very fine output for one solitary type of aeroplane engine. Probably few people outside those immediately concerned with aviation, or with the Flying Services of one nation or another, have any idea that such a vast sum of money could be spent in one year in time of peace on one solitary type of engine for aeroplanes. And even to those who are most intimately concerned with flying the vastness of the sum will come as something of a surprise.

Outwardly the chief difference between the Jupiter works as they were last year and as they are this year is that a very fine canteen has been built on the side of the road opposite to the factory. This contains large mess-rooms for the operatives, and two commodious dining rooms, one for the junior staff and one for the senior staff, and a smaller dining room for the Directors and guests. In this building there is also a big lecture room, where at proper times of the year lectures are given to the more serious-minded of the employees.

Before the guests were taken round the works, they were entertained to lunch by the Directors of the Bristol Aeroplane Company Limited. The chair was taken by Mr. W. G. Verdon Smith, who is now Chairman of the Company in place of Mr. Samuel White who died last year. In consequence also of Mr. Samuel White's death Lieut.-Colonel Sydney Smith has also become a Director. Mr. Verdon Smith and Col. Sydney Smith are nephews of the late Sir George White, who founded the Bristol Company in the year 1910. And they are cousins of Sir Stanley White, the son of Sir George White, who since his father's death has been Managing Director of the firm. Also, Mr. Verdon Smith and Col. Smith are brothers of Sir Henry White-Smith, formerly of the Bristol Company, who was for so many years Chairman of the Society of British Aircraft Constructors.

A MATTER OF HISTORY.

For the benefit of those who have only recently come into aviation or into the Aircraft Industry one had better say here that the late Sir George White was one of the very greatest of the many great business men produced by Bristol. He made his own way in the world and at a comparatively early age, at any rate by the time he was fifty, he was generally known as the "Tramway King" of the British Isles. Practically every electric tramway in these Islands has had its history influenced one way or another by Sir George White.

Thanks to him, Bristol, one of the most conservative cities in the world, has had one of the first and finest electric tramway systems, one of the finest motor-taxi systems and one of the finest motor-bus systems in this or any other country. One gathers that all this public transport of Bristol has now been taken over by the Great Western Railway, and that is why Col. Sydney Smith, who until recently was the Manager of the Bristol Tramway concern is now returning to his earlier love, aviation.

When Sir George White with his immense foresight and business acumen saw what flying was going to be some day he formed the British and Colonial Aeroplane Company, Ltd. It was the first Limited Company formed with adequate capital and a proper business organisation for the purpose of manufacturing and selling aircraft in this country. Sir

AT THE BRISTOL WORKS.—In the middle in a light suit is Sir Alliott Roe, with Sir Sefton Brancker on his right. Next, on the step above, is Mr. Roy Fedden, with Lt.-Col. Sydney Smith looking over his left shoulder. Mr. Verdon Smith (Chairman of the Bristol Co.) is the second to the left of Sir Alliott Roe.
—("*Aeroplane*" *photograph.*)

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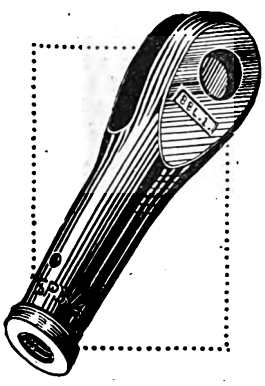

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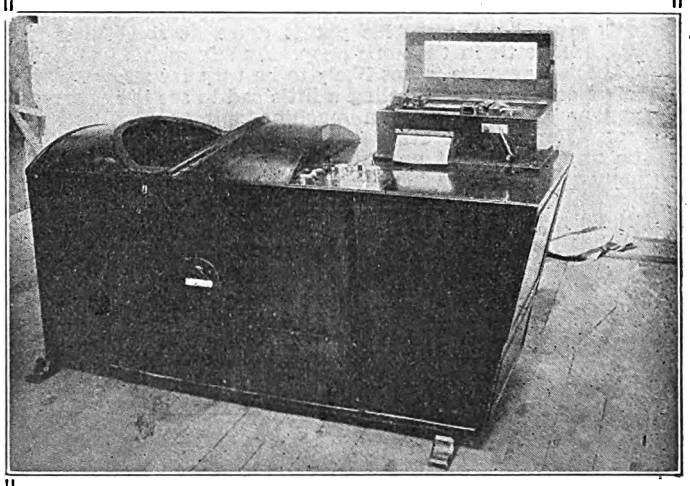

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on the ends of flexible shafts like dentists' drills very much enlarged. Because of this buffing of the inlet passages an extra ten h.p. is got out of the engine.

The fact that so much should be done is interesting because one remembers in the very earliest days of flying, Mr. Harry Ferguson of Belfast built a monoplane with a Jap engine near Belfast and by way of getting extra power out of that engine he cleaned out and polished the inside of the inlet pipes and rounded off every corner in it and in the valves and valve-ports, with the result that together with skilful tuning in other directions, he persuaded that engine up to a speed of 4,000 revolutions per minute. And he was certain that he got several hundred extra revolutions.

Those who wonder why an aero-engine costs so much to build would very soon understand the reason if they could go round the Jupiter works. For example, instead of using aluminium castings for the cylinder-heads as was formerly the custom, the Jupiter cylinder-heads are now machined out from solid forgings. The result is not only a stronger head but a combustion chamber of better and truer shape, and a general improvement all round in efficiency. Apart from the scrap metal produced by chewing out all the radiator fins and so forth from the solid, the amount of labour expended must be enormous in comparison with the cost of castings and fettling them up for fitting to the cylinders.

The underlying policy of Mr. Fedden as a production engineer is shown by the remarks of the guide of our particular party when one expressed surprise that a certain operation was done in the works instead of outside. His answer simply was "If we have any difficulty about getting a job done outside, we always do it ourselves. The only jobs we get done outside are the easy ones."

Quality and Cost.

Some idea of the capacity or rather the size of the Works may be gathered from a remark made by a very successful engineer who was with the party. One asked him whether he could give us a rough guess at the value of the machinery in the shop in which we stood, allowing nothing for the value of the business but simply estimating what the machine tools must have cost. He put it down at something like £200,000 worth in that one shop. And from his knowledge of the business, he is not likely to be very far wrong.

One could not help feeling a little sad to see the enormous number of new American machine-tools in that splendid shop. Here, as in other great British factories, one got the impression that anybody could go to America or Germany and buy a machine-tool ready made to do work which English machine-tool manufacturers will actually refuse to build a machine to do.

What proper machine-tools mean in reducing the cost of a job, and consequently in increasing the sales of it, may be gathered from a statement made by yet another very successful engineer in the train going to Bristol. He said that on a certain production job on which he was engaged, a certain operation in the works cost 2s. 8d. when done by hand. His Works Manager had gone to Germany and had bought ready-made two machine-tools to do the same work. Taking in the price of labour, and allowing for interest on and depreciation of those tools, the same job now costs 5¼d. This may serve to indicate the difference between designing for mass production and designing for cheap production.

Naturally in the Jupiter shop there is no question of designing for cheap production. But the question of designing so as to get the best possible results without spending too much money on the production certainly does arise. And often the designer finds that actually getting the best possible results costs less then producing a certain part by an older and perhaps less accurate process.

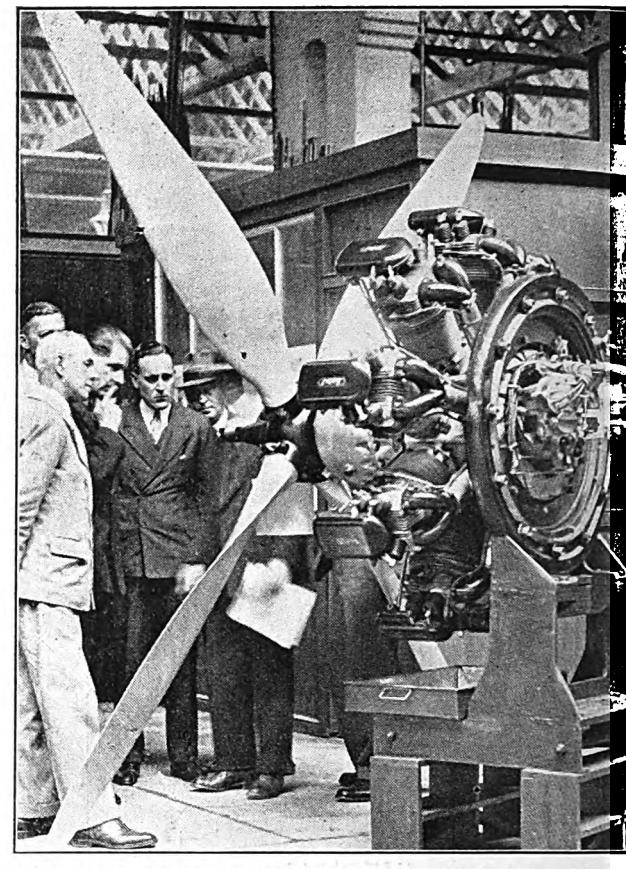
Accuracy and Workmanship.

One very interesting department in the works is laid out as a kind of museum of all the parts of a Jupiter engine. In this each part is there not as a standard of accuracy but as a standard of workmanship. Some of the parts have actually been scrapped for slight inaccuracies or flaws, but they are kept as examples of pure workmanship.

Then if any argument arises between the production engineer in charge of output and the inspection department, which is run entirely separately and is in no way interested in the output but only in quality, then the disputed part is taken along to this museum and compared with the specimen. And if it is not up to that standard of workmanship, then the production engineer has to do something to bring the rest of that batch of stuff up to the required standard.

Another thing which strikes one very forcibly about the Jupiter Works is the extraordinary orderliness and cleanliness of everything. Every shop is practically swept clean twice a day. And though this naturally costs money, the firm finds that it pays in the end because it definitely increases output. The men are able to work in better surroundings altogether, and there are no scraps or odd bits of things to get in their way.

One has met engineers of all those nations in which engineering is taken seriously, and one has been in some of the finest factories in America and Germany and France. But nowhere has one seen more perfect organisation or a higher standard of production than in the Jupiter Works. And in all countries one has met engineers of high standing who, having themselves been round the Jupiter Works, admit that they are unsurpassed in any country.



IN THE JUPITER WORKS.—Sir Alliott Roe, Major Holford and Mr. C. D. Barnard inspecting the latest type. —(*"Aeroplane" photograph.*)

One has known the Jupiter Works ever since Mr. Fedden joined the Bristol Company some ten years ago. In those days they had about thirty men at work. To-day they have about seventeen hundred. Mr. Fedden began with the highest class of work as a standard and to-day the same standard is maintained, and it is maintained simply because it cannot be improved.

Where design is concerned there is another story. The original Cosmos Jupiter, from which the Bristol Jupiter was evolved, was a fine job in its day, but it would look a heavy clumsy job alongside its descendant, the Jupiter of to-day. And, knowing something of Mr. Fedden's progressive ideas, one does not hesitate to say that some day the Jupiter itself will seem heavy and clumsy alongside its successors. But whatever may be evolved from it, there can be no doubt that the standard of accuracy and workmanship will remain the same.—C. G. G.

AUTO-GIRO RESEARCH.

In the House of Commons on May 21 in reply to a question by Mr. D. G. Somerville, the Under-Secretary of State for Air said that research work on the Auto-Giro type of machine had been provided for and was being pursued but it was not possible to state the precise allocation for this purpose. The provision for it was merged to a great extent in the estimate for general research from which it could not be segregated. The amount of expenditure must depend on the progress made.

AIRCRAFT AND WIRELESS TELEPHONY.

In the House of Commons on May 21 in reply to a question by Mr. Everard, the Under-Secretary of State for Air said that the civil aerodromes at Croydon and Lympne and the airship station at Cardington had means of regular communication by wireless telephony with civil aircraft. In addition the wireless telephony stations at Pulham and Renfrew had telephony equipment. Experiments for instructional purposes in communication by wireless telephony from the ground to aircraft in flight were being conducted at the civil aerodrome at Heston. The question of giving help at other civil aerodromes was under consideration.

MR. CANTRILL'S NEW APPOINTMENT.

Mr. J. Conway Cantrill has relinquished his position with Pinchin, Johnson and Co. Ltd. to take up a position with Cellon Ltd., whose doping schemes and cellulose finishes and lacquers are famous throughout the aircraft and motor industries. Mr. Cantrill's many friends will wish him every success in his new venture.

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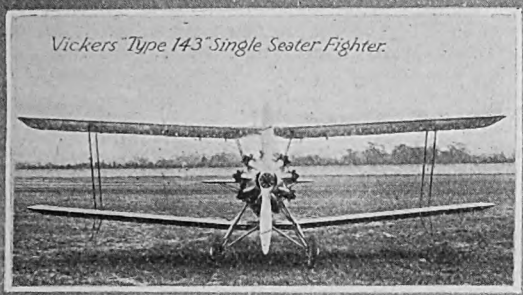
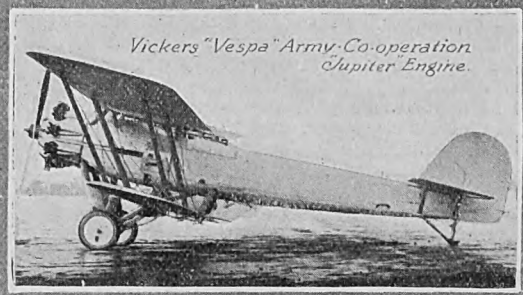
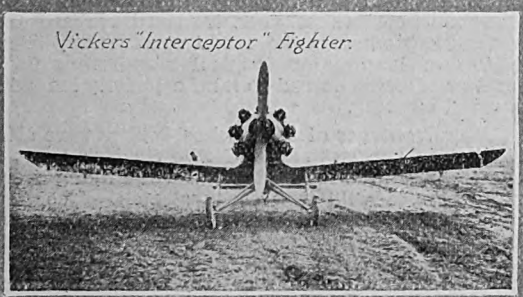

Vickers "Type 143" Single Seater Fighter.

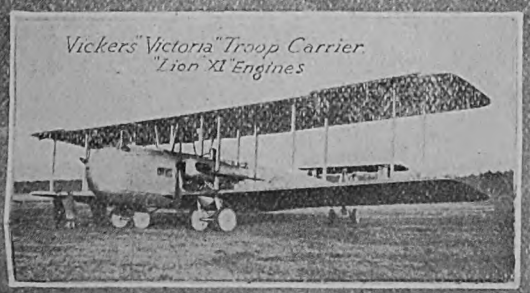

Vickers "Vespa" Army-Co-operation "Jupiter" Engine.

Vickers "Vildebeest" Torpedo Bomber. "Jupiter VIII" Engine.


Vickers "Interceptor" Fighter.

Vickers "Virginia" Bomber "Jupiter" Engines.

Vickers "Vellore" Freighter.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upright engines because we were afraid of shocking conventional aircraft designers too much by daring to use two inverted engines at the same time. And we used a braced monoplane because we were afraid that a full cantilever monoplane with engines built into the wings would be too revolutionary. Sir Henry Segrave was not troubled by any such scruples, so he went for a revolutionary design.

Whether the machine performs as well as it looks remains at the moment to be proved. No matter how well an aeroplane may look on paper, and no matter how well it may perform according to calculations, nobody can really tell what it will do until it is in the air. The most careful calculations may result in a machine having a rudder or an elevator or a fin or a tail which is too small or too big.

The early twin-engined Fokkers were bad to fly because the fin and rudder were not in the slip-stream. To get over this the noses of the engines were turned slightly outwards so as to make the two slip-streams converge onto the rudder. Whether this is still done one cannot say. The designers may have discovered some way of getting over the trouble.

Similarly, nobody seems quite to know what happens to the tail-unit when alow-wing cantilever monoplane is turning rapidly. Sometimes the wings blanket the tail completely. Sometimes they do not. In the big Junkers there is a biplane tail with twin rudders, one for each slip-stream.

What will happen with a small low-wing twin-engined machine remains to be seen. As the Americans say, the bugs have to be got out of anything new. If anything new turns out right at the first attempt it is very wonderful. And if it does not, it need not necessarily be considered a failure.

The first of the Segrave Meteors has been built by Saunders-Roe Ltd., one of the firms in which the Aircraft Investment Corporation is interested. And one gathers that, subject to the first machine performing properly, several others, which will be constructed chiefly of duralumin, will be built by the Blackburn Company at Brough to the orders of well-known sportsmen.

The accompanying photographs show the general appearance of the machine and the specification is as follows:—

SPECIFICATION.

DIMENSIONS.—Span 39.5 ft. (12 metres), Chord 8 ft. to 5 ft. (2.44 to 1.52 metres), Area 320 sq. ft. (21.4 sq. metres), Length overall 28 ft. (8.55 metres), Height overall 7.5 ft. (2.28 metres), Track 7.0 ft. (2.14 metres), Engine centres 11 ft. (3.3 metres), Engine inset 3°.

LOADINGS.—Power 11.31 lbs./h.p. (5.12 kg.cv.), Surface 10.93 lbs./sq. ft. (48.5 kg./m.).

WEIGHTS.—Empty 1,725 lbs. (784 kg.), Fuel and oil 345 lbs. (156 kg.), Pilot 170 lbs. (72 kg.), Pay-load 510 lbs. (231 kg.), Gross 2,750 lbs. (1,246 kg.).

PERFORMANCE.—Top speed, sea level 140 m.p.h. (225 km.h.), Cruising speed 125 m.p.h. (200 km.h.), Stalling speed 50 m.p.h. (80 km.h.), Climb, initial rate 1,000 ft. per min. (381.25 m./min.), Ceiling (absolute) 17,000 ft. (5,150 m.), Endurance 4 hours.

PRICE.—£2,300 (De Luxe Model: £2,575).

MORE RECORDS FOR ARMSTRONG SIDDELEY.

The Royal Aero Club has been notified that the following performances have been homologated by the *Fédération Aéronautique Internationale*, as International Records in the first category of the two-seat light aeroplane class for machines weighing less than 400 kgs. (880 lbs.).

Altitude (Germany). Waldemar Voigt, in the D.18 biplane of the *Akademische Fliegergruppe*, Darmstadt, with an Armstrong Siddeley Genet Major engine (100 h.p.) at Darmstadt on Apr. 21, 1930, reached a height of 7,521 m. (24,819 ft.).

Speed over 100 km. (Germany). Rudolf Neininger in the same machine at the same place and two days later reached a speed of 214.848 km./hr. (134.3 m.p.h.

The height record had previously been held by Italy with height of 6,782 m. (22,240 ft.). The speed record had been held by Mr. and Mrs. Alan Butler for Great Britain, who put up in their Gipsy-Moth a speed of 192.864 km./hr. (119.8 m.p.h.).

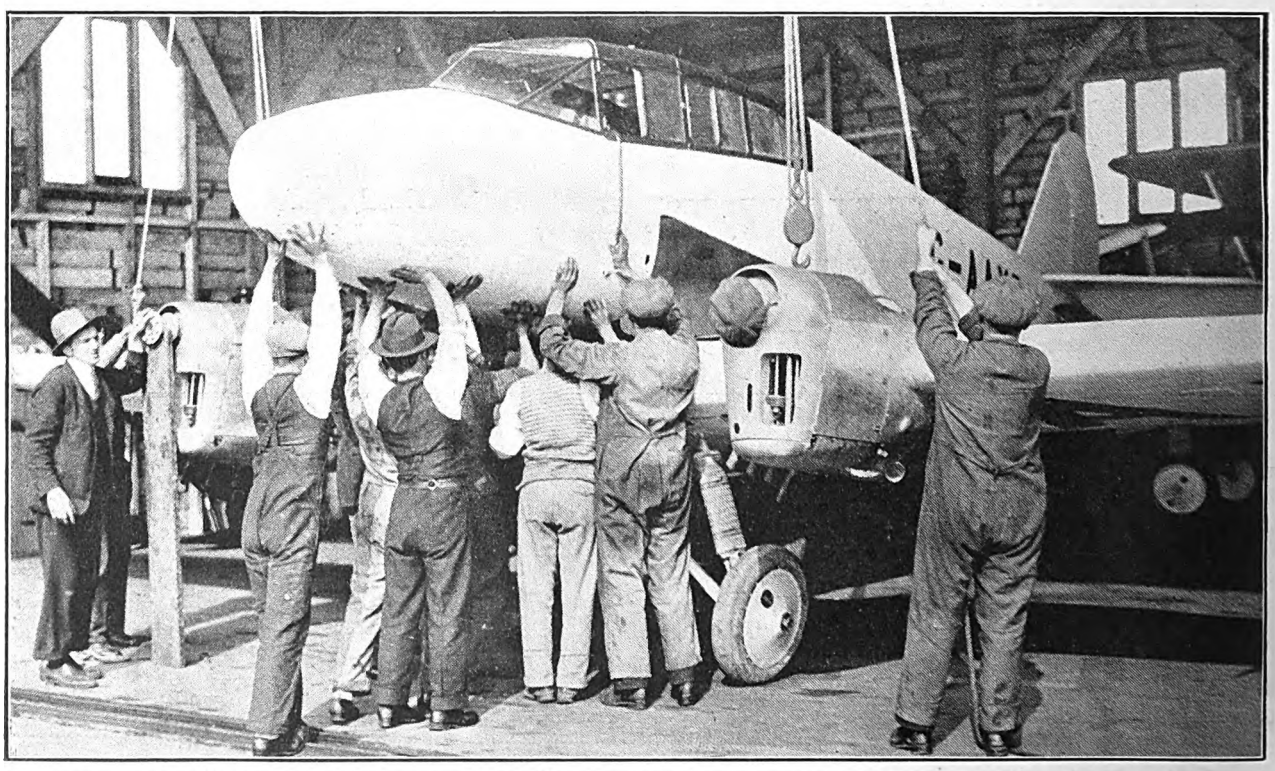
The D.H.18 was described in THE AEROPLANE for Apr. 3, 1929, and was at that time fitted with the 80 h.p. Genet engine. The D.H.18 is a particularly clean-looking two-seat cantilever biplane with a very marked degree of stagger.

BENDIX BRAKES ON THE SPIDER.

Before Her Grace the Duchess of Bedford left for her record-making flight to the Cape and back in *The Spider* with Mr. C. D. Barnard as pilot, and Mr. R. Little as second pilot, navigator and engineer, the machine was fitted with Bendix wheel brakes. Mr. Barnard realised that a really satisfactory wheel-brake would considerably lessen the difficulties of landing on tropical aerodromes far above sea-level or of being forced to land a heavily loaded machine in a small clearing.

The advantages of these wheel-brakes were clearly demonstrated on the last stage of *The Spider's* great flight when the machine was forced to land while flying over the Dragoman Pass, a wild and rocky stretch of country which is notorious among aviators for its difficulties and dangers. Fortunately there was a small clearing in which to land and here, in spite of the big load of petrol,—over 3,000 lbs. of it,—the machine was quickly and safely brought to rest in the confined space by its Bendix brakes. Mr. Barnard says that quite apart from their value in an emergency like this, a pilot appreciates the extra control which is given by wheel-brakes to an aeroplane when taxying.

There is no doubt that wheel-brakes will become a standard aircraft fitment. As clearly demonstrated by *The Spider* they are of incalculable value in an emergency. They have too the added advantage of increased control on the ground.



ASSEMBLY.—Slinging the wings, complete with Gipsy engines, onto the fuselage of the Segrave Meteor.
—(*"Aeroplane" photograph.*)

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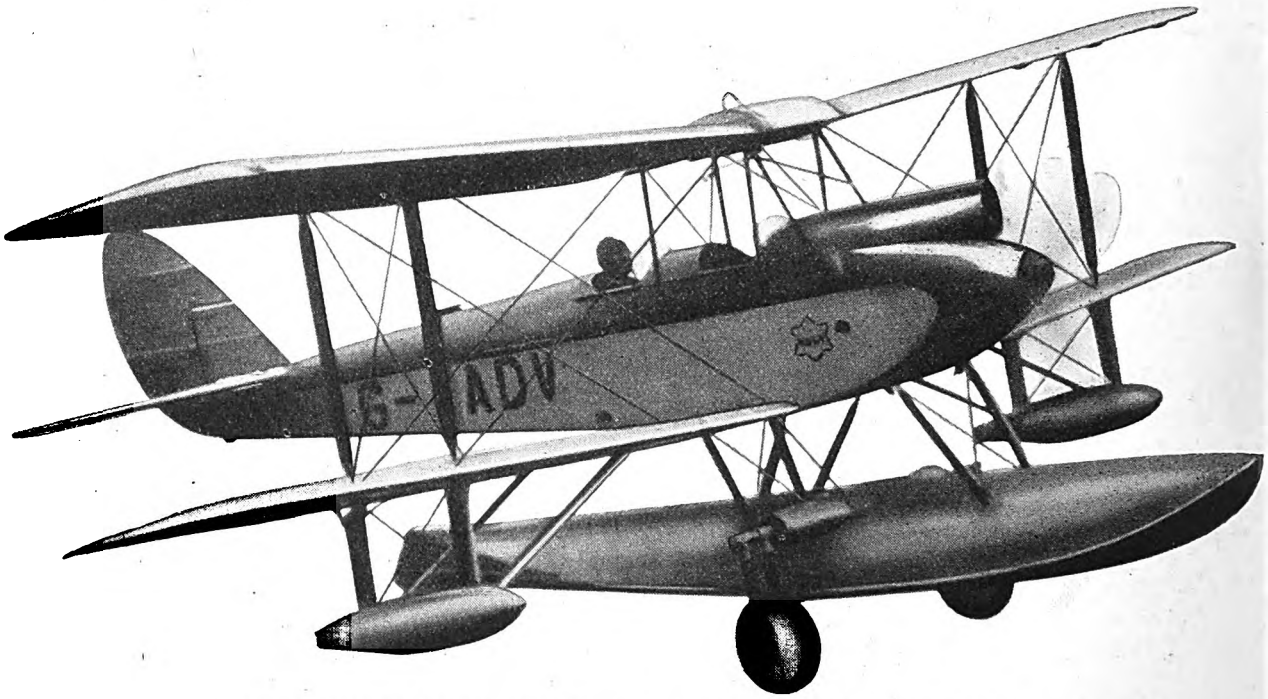

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THE LIGHT AEROPLANE
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MISS JOHNSON'S TRIUMPH.

On the afternoon of May 24, at 15.57 hours, Miss Amy Johnson, B.A., landed her D.H. Moth (Gipsy), G-AAAH, at Port Darwin, Australia, on the twentieth day after her start from Croydon Aerodrome.

When she set out no one seriously entertained the idea that she might better the time of 15½ days set by Mr. Bert Hinkler in 1928, in spite of a faster machine and somewhat better arrangements for supplies. Any doubt was not due to the fact that she is a woman but because she was then a pilot of less than 100 hours solo experience and very little knowledge of cross-country work. There was a time when she seemed to be in a fair way to set up a new record, but popular enthusiasm took less than reasonable account of the fact that Mr. Hinkler's journey was most remarkable on its second and more difficult half.

There are so many compelling reasons why Miss Johnson could never have done what she has done that it would be a childish quibble to analyse her failure to do more. It is definitely one of the great flights of history, and THE AEROPLANE regretfully refers to its more emotional contemporaries those readers who consider that there are suitable adjectives for even the most sincere admiration.

A CONGRATULATORY DELUGE.

Two or three hours after the good news of the *Jason's* safe arrival became known in England the following telegram was received by the Governor-General of Australia:—

The Queen and I are thankful and delighted to know of Miss Johnson's safe arrival in Australia and heartily congratulate her upon her wonderful and courageous achievement.—GEORGE R.I.

The Prime Minister also cabled his congratulations:—

My heartiest congratulations on your wonderful achievement. We have followed your flight with the keenest interest and admiration. We are very proud of you.—RAMSAY MACDONALD, Prime Minister.

Lord Thomson, Secretary of State for Air, cabled:—

On behalf of the Air Council I send warmest congratulations on the completion of your magnificent flight. As the first woman pilot to fly to Australia you have achieved an outstanding feat of skill and endurance, and we have watched with admiration the coolness and courage which have carried you through to your goal in the face of unforeseen difficulties and disappointments.

Col. the Master of Sempill, Chairman of the Royal Aeronautical Society, sent the following message:—

The Royal Aeronautical Society, fully realising the inadequacy of words on this occasion, send you most cordial felicitations on the completion of your plucky flight. Your splendid and complete triumph over the many serious difficulties mainly provided by Nature has not only earned in full our most sincere admiration but has given another convincing demonstration of the remarkable qualities of our light aeroplanes and engines that will redound widely to the credit of British aviation.

Dr. Gerald Merton, Chairman of the Air League Executive, wired:—

Air League of British Empire congratulates you on magnificent flight and hopes you may inspire British aviation and raise it from its apathy.

AUSTRALIAN ENTHUSIASM.

Throughout the Commonwealth rejoicing was unbounded. Mr. Scullin, the Prime Minister, telegraphed to Miss Johnson:—

Heartiest congratulations on your wonderful achievement, which has won the admiration of the whole world. On behalf of the Commonwealth Government I desire to extend to you a cordial welcome to Canberra while Parliament is in session. We sincerely hope you will be able to arrange this visit. Best wishes.

The Returned Soldiers' League sent a message in which they said:—

We welcome you as the embodiment of that spirit which prompted British womanhood during the War to innumerable acts demanding the qualities of self-reliance, endurance, resoluteness, and sheer pluck.

One of the most novel of the messages was from the Kuomintang Society on behalf of the Chinese of Australia. It said:—

We rejoice that we are privileged to offer congratulations to the world's greatest airwoman after what is considered by experts one of the most wonderful feats accomplished by a human being. We are pleased for another reason; the incident proves that there is a great force in this world like a new powerhouse whose Star in the East is daily becoming brighter . . . . Now we can see that given equal opportunity we can look to women to provide not only brain power but heroism and gallantry as instanced in the present remarkable flight surpassing anything of the kind recorded by either sex in the history of the world. Your act of gallantry will cause a higher plane of thought throughout the world and will much enrich the history of your great country.

These are only a few of the thousands of missives which await the now celebrated young lady at the end of her journey, but perhaps the surest index of real fame, now that she has expressed her preference in familiar nicknames, is the sudden and Australia-wide popularity of the old song: "Johnnie's in Town."

PROGRESS SINCE LAST WEEK.

Miss Johnson left Singapore early on May 19 to fly to Sourabaya, but owing to bad weather and dwindling fuel was forced to land on a sugar estate at Tjomal, on the island of Java. In many ways this was one of the worst stages of the flight, as Miss Johnson was forced to make detours several times because of tropical storms, and flew so low over the Java Sea, which was very rough, that she admits having been alarmed and discouraged.

Realising that she could not reach Sourabaya, and later that her fuel would not last to Samarang, she made a landing at Tjomal, where her wing fouled some bamboo stakes and was torn in five places. The employees of the estate assisted her to do temporary repairs, and a hazardous take-off was made from the small and wet field to a better one five miles away, where the heavier impedimenta were again loaded on board.

The wing-repairs were not such as to permit a long flight, so Miss Johnson went to Samarang, 50 miles away, and had the wing seen to by our good friends of the K.N.I.L.M., after which she flew to Sourabaya behind the regular machine of the Royal Netherlands East Indies air-mail.

On Wednesday Miss Johnson did not attempt a further stage of her journey owing to some trouble with a magneto, but set off on Thursday with the intention of landing at Bima, if the engine were not functioning properly, but possibly to continue to Atambua, on the island of Timor, if all went all.

She was sighted over Bima, 400 miles on the way, 5½ hours after the start, and was evidently satisfied with her engine as she continued.

She was not seen thereafter, and as she was due at Atambua about 16.30 considerable anxiety was felt. The wireless station at Kupang, 10 miles from Atambua, is in communication with sub-stations on most of the islands in the group, and remained open until late that night without hearing any word.

On Friday word was received that Miss Johnson had made a landing at Haliloelik, about 12 miles from Atambua and 750 from Sourabaya. From this point, on the Island of Timor, a journey of 600 miles, with a sea crossing of 400 miles, brought Miss Johnson to Port Darwin, her first objective on the Australian continent.

The last stage, admittedly one of the most dangerous of the journey, was declared by the pilot to have been one of the least eventful and most pleasant. But her relief on sighting the oil-tanker *Phorus*, and confessedly tearful joy when she actually saw Melville Island, will strike a responsive chord in all not-too-experienced airfarers who have flown across unpleasant land or water.

Miss Johnson was wildly welcomed at Port Darwin, both on the aerodrome and at the Town Hall, where there was a civic reception later in the evening.

Miss Johnson left Port Darwin on Monday morning, refuelled at Daly Waters, 320 miles away, and then continued to Alexandra Station, a further 280 miles. This is the second largest cattle station in the World, but it has no telegraphic communication with the outside World, so the World had to wait for further news until she reached Long Reach, Queensland, another 600 miles away.

The journey lies over bad country with practically no inhabitants. Miss Johnson outdistanced her escort from Port Darwin owing to the greater speed of her cleaned-up plane, and flew most of the last two stages alone.

HER AIDS TO VICTORY.

Miss Johnson made her triumphal progress on Shell, supplies of which were ready for her all along her route. The engine went round on Castrol, the lubricant which has kept so many engines running smoothly on their various ways to successes and records. The steady stream of sparks at the K.L.G. plugs that made the regular running of the D.H. Gipsy engine possible came from B.T.H. magnetos.

The navigation of *Jason*, as Miss Johnson named her machine, has been much commended. Miss Johnson followed the lead of so many experienced pilots and used a Husun Aperiodic Compass, Stanford's Maps, and Armour Wind Indicators. An Irvin parachute assured safety in case of emergency.

The fabric of her machine, like that of so many machines on similar occasions, was doped with Titanine, which en-

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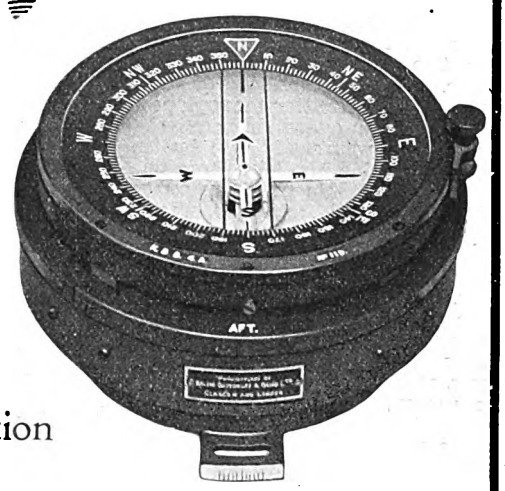

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THE SCOTTISH FLYING CLUB GALA.

The custom of the Scottish Flying Club for some years has been to hold an annual pageant on the occasion of the visit of competitors in the King's Cup Race.

Glasgow having been eliminated from the route of this year's Race, the Flying Club at Renfrew Aerodrome, with Scottish independence, staged a Flying Gala extending over the week-end, 24th—26th May.

Chief among the attractions offered was the Imperial Airways Argosy *City of Glasgow*, which carried over 3,000 passengers during the Gala, piloted by Mr. O. P. Jones. And as the result of the Gala some 50,000 Glaswegians are now somewhat more airminded than heretofore.

The three club Moths were much in evidence, together with two privately owned Moths, and that of the Shell people. With the addition of an Autogiro, a Klemm monoplane and a Desoutter monoplane there was some variety.

On Sunday a slow-flying contest between the Autogiro and the Klemm was easily won by the former.

The inevitable Mr. John Tranum made parachute descents with his inevitable precision on each afternoon.

An "Air Mail Robbery" was staged each day as "set piece" and was greatly appreciated by the crowd, and the ultimate triumph of right over wrong should result in an appreciable increase in Air Mails from Scotland.

Mr. George Murray, of Edinburgh, who gained second place in the recent International Aerobatics Competition, performed with great skill and precision on one of the club Moths. In particular, this young man's upside-down work was a revelation of his capabilities. Making allowances for the spectacular necessity of Mr. Murray's show in the present instance, one sincerely hopes that his future efforts will be confined to somewhat higher strata. [Question:—Is a seat-type parachute really effective under 300 feet? If not, why does Mr. Murray wear one?]

In conclusion, one would like to bestow bouquets as follows to those responsible for giving Scotland this most successful show:—Mr. Harry Smith, organiser and "general manager"; Mr. G. F. Luke, publicity merchant; Mr. J. Cairns Smith, the announcer with the Golden (Shell) voice; Mr. Brian Miller, O.C. Flying; the Club Instructor, Mr. John Houston, for spending most part of three days in the air; and the Club members, Mr. G. F. Yuill, Mr. George Walker, and Mr. A. Dunlop, for prodigious labours in a good cause.

J. TALBOT.

THE PETERBOROUGH FLYING MEETING.

Peterborough's first flying meeting on Saturday, May 24, at Mr. K. Whittome's private aerodrome at Horsey Tole, was a huge success, thanks to the untiring efforts of Mr. Whittome and the Flying Committee of the Northamptonshire Club.

The programme was opened by Flt. Lt. Rose, who gave one of those marvellous exhibitions of crazy flying which he does so well. Some very effective formation flying was done by Mr. P. Grey, Flt. Lt. Rose and Mr. Ruutz-Rees.

There were some exciting moments during the race between the club private owners, over three laps of the course. Mr. G. Linnell got away first and led for nearly two laps when he was overtaken by Mr. P. Tyzack. The greatest excitement occurred during the last lap when Mr. K. Whittome managed to overtake the others on the post.

Mr. Palmer—the Club instructor—flew over from Northampton and gave an excellent aerobatic display in G-AAIE. Mr. S. A. Thorn showed that a Desoutter, besides being as comfortable and luxurious as a saloon car, can also be stunted with the greatest of ease—*by* Mr. Thorn. The little blue Klemm, which has apparently taken out naturalisation papers and become a good British Citizen by its lettering, was flown by Mr. Rogers, who knows how to show it.

During the afternoon there was joy-riding by the Brooklands School of Flying. Some idea of the keenness of the people to fly may be gathered from the fact that Mr. Davis himself took over 150 people for flights.

The visiting pilots included The Hon. Loël Guiness, who flew a new Bluebird G-AAUV, and brought with him Mr. Fitzwilliam, the prospective Conservative Candidate for Peterboro'. Mr. Fitzwilliam, whose family has been connected with Peterborough and the Fitzwilliam pack for generations, immediately became a member of the Northants Aero Club. Sq. Ldr. Ridley and Mr. Andrews came in another new Bluebird (G-AATS), Mr. D. Bruyne and Mr. P. Grey from Cambridge in Moth G-AAWN, Mr. Downes-Shaw from Bristol in Moth G-AALV, Mr. B. Sallen in Henly's Avian G-AAVM, Sq. Ldr. Vachell and Flt. Lt. Carnegie in G-AAEL, Mr. Rogers in Klemm G-AAZH, Mr. S. A. Thorn in the Desoutter G-AAWT, Mr. R. Ruutz-Rees from Brooklands in G-EBZH, Ft. Lt. Rose in G-AAKJ, Mr. Davis in Avro G-AACA, Mr. Palmer in G-AAIE, Mr. P. Tyzack in G-AAGS, Mr. K. Whittome in G-AAVR, and the brothers Linnell in G-AAFK.

A delightful lunch was provided by Mrs. Whittome, Mr. K. Whittome's mother, for all the visiting pilots.

Mr. Whittome will be pleased to see any visitors who care to call at Horsey Tole aerodrome, which is fully licensed and is east of Peterborough on the Whittlesea Road.

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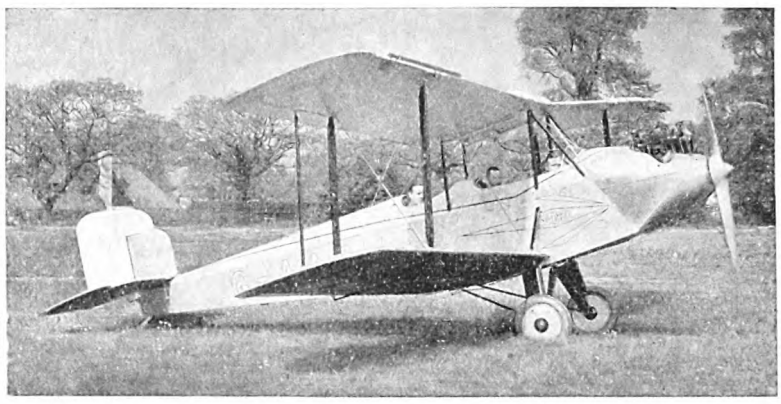

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COMMERCIAL AERONAUTICS.

EXTENDING THE NETWORK.

Negotiations are afoot for a regular air service which is to join the three towns of Liverpool, Manchester and Birmingham with Croydon. This would provide a feeder service from the Midlands for the main lines to Australia and the Cape. Imperial Airways is negotiating with the three municipalities, and on May 23 the Finance Committee of the Liverpool Corporation recommended that a subsidy of £1,000 should be offered by the City to Imperial Airways towards the cost of operating such a service.

The General Purposes Committee of Birmingham Corporation have now considered this scheme and has decided to recommend the City Council to provide a subsidy. On May 26 the Lord Mayor stated that the Committee was in favour of providing a subsidy not exceeding £1,000 on the condition that financial support was also forthcoming from Liverpool and Manchester.

As *The Manchester Guardian* says in its leader about this service a regular service that brings the chief Continental centres within five to ten hours of our manufacturing areas is bound sooner or later to establish itself.

This appears to be a good opportunity to use small and fast multi-engined feeder machines such as the Westland Wessex, the Avro Five and on occasions the Desoutter, instead of the slower and obsolescent machines of the Imperial Airways fleet. Safety, speed and comfort are the chief ingredients for a service of this kind and as the service is for business men the prices must be reasonable.

This is more so because for at least 60 days in November, December, January, and February no aeroplane can hope to fly to schedule time anywhere North of the Potteries, and probably on 30 days during those months flying of any kind at any time will be impossible. So small mobile machines, which can stand idle at small expense, or can be used for taxi-work elsewhere are obviously preferable to big aeroplanes of the "liner" type.

'TWAS A DARK AND STORMY NIGHT.

Through the Press the feelings of the citizens of Maidstone, roused by a circling *Sabena* night-mail Fokker in the very early hours of last Friday morning, have been made known. They invoked the authority of the Law, and with the aid of the chief constable, plus a trunk call and Croydon wireless, they told the pilot to move on.

His feelings have not been dealt with in detail, probably because they are so far beyond description that they could not even be imagined by anyone who has not been hemmed in by fog at night with a heavily-loaded aircraft and been told off with words to that effect.

Whatever they were, he stayed where he was, namely, circling the immediate vicinity of Maidstone at about 300 ft. Meeting with fog over the Downs on his way from Brussels the pilot tried to return to Lympne but found himself hemmed in over Maidstone by low clouds and fog in all directions. In spite of weather reports from Croydon he considered the conditions too treacherous to go on.

Police officials stated that they were concerned with the safety of both the aircraft and the citizens, as the former was flying very low and seemed to be in difficulties.

AN UNDERSTATEMENT.

There was in THE AEROPLANE for May 14 a very instructive survey by Mr. W. S. Stiles, of the preliminary work which has been done at the recent International Aviation Lighting Meeting in Berlin. Mr. Stiles in his opening paragraph gave a summary of the air-lines in each country which have been illuminated for night flying and owing to a typographical error was made to conclude by saying that Great Britain had none. To an extent this is an understatement. There is no night-flying by British machines over British air routes except on the route to India, where sometimes machines have to land in the dark unintentionally. But the main air-route from Croydon to the coast is somewhat lit,—over a distance of about 100 km. Besides the Terminal lights at Lympne and Croydon there are lighted emergency grounds at Marden and Penshurst, and there is a beacon of sorts at the top of Titsey Hill. But this is not lighting according to American or Continental standards. And what lighting there is only works for the benefit of our excellent foreign rivals who use our lighting system for their own night-mail services to Berlin and Brussels.

FOR THE NIGHT MAIL.

The Air Ministry gives notice that as from the evening of 28th May, and until further notice, the period of the Cranbrook air light will be increased from 7 seconds (as at present shown in *The Air Pilot*, Vol. 1, page 37) to 10 seconds. The new characteristics of this light will be approximately as follow: Light 0.15 sec.; eclipse 0.7 sec. Light 0.15 sec.; eclipse 0.7 sec. Light 0.15 sec.; eclipse 8.15 secs.

This alteration is experimental only and is designed to increase the range of visibility of the light by prolonging the duration of each of the three flashes.

All pilots are requested to observe the Cranbrook air light on all possible occasions, and compare its visibility with that of the Tatsfield air light, the period of which, viz., 7 seconds, will remain unchanged for the present. Reports of any observations or comparisons so made should be addressed to the Secretary, Air Ministry (C.A.4), Gwydyr House, Whitehall, S.W.1, as soon as possible.

TO THEIR MUTUAL ADVANTAGE.

On May 23 M. Hymans, the Belgian Foreign Minister, M. Lippens, the Belgian Minister of Transport and M. Laurent Eynac, the French Air Minister, signed a convention for the establishment of an air line to link Belgium and France with Central Africa and the Congo. A regular weekly service is to be run in both directions.

The convention, which has been drawn up for ten years, can be prolonged by mutual agreement.

PEACEFUL PENETRATION.

The Times for May 20 says:—

Four American Curtis Wright aeroplanes which are touring Europe have arrived at Constantinople from Bucharest. They will visit Es-Kishehr, the headquarters of the Turkish Air Force.

This probably refers to a circus of Curtiss aircraft which Major Melvyn Hall, formerly U.S. Army Air Attaché in this country, and now employed on special missions by the Curtiss Company, is taking round to demonstrate to the Army and Air Authorities of European Nations.

The chief pilot was to have been the famous Lieut. Doolittle, who some years ago won the Schneider Trophy for the U.S. Army.

ROMEO AEROPLANES IN ENGLAND.

Mr. W. G. Pudney, formerly of the R.A.F. and a test-pilot at Martlesham, who served recently as an instructor with the Royal Canadian Air Force, is now sole concessionaire in England and the Dominions for Romeo aeroplanes.

He has recently flown from Naples in the Ro 5, a tandem two-seater high-wing monoplane, and will be present with it at the Bristol Pageant on May 31.

A company is to be formed within two or three months to develop the possibilities of this aircraft, which is said to be very nice to fly and exceedingly well made. It is generally equipped with a Fiat 85 h.p. radial engine.

The headquarters of the company will be at Heston, where the Ro 5 is at present.

A NEW AGENT FOR LORRAINE ENGINES.

Mr. J. Bilefield has been appointed agent for Lorraine aero-engines in this country. The range of powers in the Lorraine series is unusually wide, and the company is one of the few which produces air-cooled and water-cooled types.

The smallest is the 100 h.p. five-cylinder radial air-cooled, and intermediate types furnish powers up to the 700 h.p. eighteen-cylinder broad-arrow water-cooled motor.

The 450 h.p. water-cooled Lorraine has been fitted to the Supermarine Southampton, the Fairey III.F and many French long-distance machines.

Mr. Bilefield's address is 37, Albemarle St., London, W.1.

MOTH SERVICE AT THE BRISTOL PAGEANT.

The De Havilland Aircraft Co. Ltd. announce, as THE AEROPLANE goes to press, that the firm will not be sending its own service lorry to the Bristol Pageant on May 31. Arrangements have been made that the lorry belonging to Airwork Ltd., of Heston, shall carry all Moth and Gipsy spares, and De Havilland personnel will be in attendance with it at Bristol.

THE LAST INSTALMENT.

The *Southern Cross*, to complete its circumnavigation of the World by instalments, has still to cross the Atlantic, and, as already reported in THE AEROPLANE, plans are afoot to bring the wheel full circle.

According to *The Times* Mr. Kingsford Smith arrived in Dublin during the week-end (May 24-5) and was the guest of the Governor-General at the Viceregal Lodge. He is making preparations for a transatlantic flight, and after carefully examining several possible starting places he decided on Phoenix Park.

He will go to Amsterdam very soon to take the *Southern Cross* over to Ireland. Mr. Vandyk, a pilot of the Dutch Air Line to the East Indies, has accepted an invitation to accompany him as assistant pilot. Another member of the crew will be Mr. J. W. Stannage as wireless operator. Captain Saul, formerly of the Free State Army, will be his navigating officer. The flight will probably start at the end of June.

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MAPS FOR THE KING'S CUP RACE.

Raynoil Maps Ltd. wish intending competitors in the King's Cup Race to know that they are again turning out a special Race map. This new map includes many improvements as the result of suggestions from some of the famous pilots who have flown in previous races. Anybody who wants further particulars is invited to write to Lincoln House, High Holborn, W.C.1.

MANY INVENTIONS.

To rush forth into the bright dawn of a new day in the evening kit of yesterday, in some spot such as Leicester Square, and, approaching a stertoriously slumbering road-up merchant in his little tarpaulin tent, to address him with words similar to—"Watchman—I say, watchman—er—hic—Whattov the Night, eh, what?"—is universally thought inauspicious. In other words, there is a time and a place for everything, and for what follows, especially a place perhaps.

When a gentleman is down in a reasonably-sized field, dotted fairly thickly with the raw material of mutton broth, and when the said gentleman, gazing upwards through a monocle obscured by a low cloud, observes first a Desoutter and then a Moth have a look at his field, hesitate and pass on, it does not necessarily mean that—(a) They do not desire his company, or (b) that they are not capable of landing in his field.

In the case we have in mind, the two aircraft that passed on were peopled by extremely wily veterans of a severely practical turn of mind, and they were just in search of a better 'ole, which they found. Landing a minute or two later beside a Country Mansion, the veterans, themselves of Scots ancestry, were hospitably hailed by the owner, who, judging from his nice taste in Scotch, must also have been a Scot. Not only did their host thus pleasantly beguile for them the period of waiting, but flew with one of them to Shoreham, entertained them nobly again on the way back, and also booked extensive flights with one of them for the future. Which is business delightfully blended with pleasure and a far, far better thing than lingering damply in a "klemmy" field along of a lot of silly sheep.

Incidentally, it was Jock Anderson (whom Allah preserve) who did the wing-walking at Shoreham, and who accompanied Mr. R. Wyndham there in G-AAUS, one of the machines which found the "better 'ole" aforesaid.

On May 18 Mlle. Lina Bernstein made the first commercial flight with paying passengers ever made to Croydon so far as we know, by a female pilot. Mlle. Lina, a slim attractive figure in a blue leather flying-coat to match the colour scheme of her Farman monoplane, came through somewhat unpleasant weather, unlikely, however, to perturb a pilot of her experience.

Her passengers, as a matter of fact, obeyed some obscure code of behaviour and deportment of their own, which is not usual in this country. According to this code, they were doubtless models of correct deportment, but in no way did they add lustre to the proceedings.

Mr. Bob Little has spent a somewhat harassing week in a miniature Sahara (conveniently situated in relation to Oases with cooling streams) in the vicinity of Shell Corner, Bush House, etc. The desert, where the *Spider* rested after her labours, was kindly provided by Shell Mex. So doubtless were some of the cooling streams, probably in that excellent oasis the Waldorf.

The best question Bob had to answer was from an old lady who asked him whether it had not been difficult to land there without interfering with St. Martins Le Strand. Bob was understood to reply that he had known more difficult landings on the way back from the Cape.

Air Union ask us to give vent to words to the effect that the burglars who broke into the freight-carrying Goliath at Berck got away only with a bunch of artificial flowers of no commercial value. It is absurd, at this time of day, to urge Air Lines to take a new attitude towards the serious things of life because of an isolated incident of pilferage of this sort.

The Air Lines to-day have a highly organised freight-carrying system which is admitted on all hands to be vastly superior to that of any other form of transport in the matter of careful handling, as well as of swift delivery.

Very many big Firms send their goods by air for the reason that careful handling allows light packing and consequently reduced packing costs. Valuable paintings are carried practically not packed at all between Holland and England, X-Ray tubes and delicate instruments travel by air, and every sort of freight from bullion to fresh fruit and newly-cut flowers are handled with appropriate care by expert Air Line freight staffs. Only the other day a customer informed us, for example, that the only day-old chicks which ever arrived 100% alive and supremely cheerful, did so by air. Others fetched up dead or suffering from acute depression.

A Prime Minister should, we believe, display a nice taste in whatever he undertakes, from the consumption of a bottle of vintage port to the selection of a necktie. That the best in the matter of transport is good enough for Mr. Ramsay Macdonald was proved on Saturday last when he flew to Edinburgh from London piloted by Mr. O. P. Jones, in Imperial Airways Argosy G-AACI (*City of Glasgow*). Mr. Macdonald was accompanied by Miss Ishbel, and the machine continued to Glasgow after dropping the Prime Minister at Edinburgh.

The whole of Jack Hylton's band, 19 persons in all, came through to Croydon from Amsterdam on Sunday last in the new F.IX belonging to K.L.M. Mr. Sillevis, the pilot, had some difficulty in getting in as the clouds were on the hill-tops and the weather was wicked. However, Jack Hylton and his merry men were brought in and the Pathé Noise Unit listened to a chorus with which they obliged on the tarmac, ably conducted by Mrs. Jack. The Welkin was well and truly wrung, in fact.

In the sort of bad weather we have had lately we cannot be too grateful for the efficient and courteous way in which both Traffic Officers and Wireless Operators in the Control Tower do their job, which is under these circumstances an extremely trying one. No trouble is too much for them and they never get ruffled when we get over-anxious and worry them. There is surely a niche in High Heaven awaiting people who spend this life in the Control Tower in Croydon, but whether they will ever meet members of other Air Ministry departments there, is open to grave doubt.—SPRY.

MR. DORMAN'S MOVE.

Mr. Geoffrey Dorman, late R.F.C. and R.A.F., who has been an advertising representative with THE AEROPLANE for the past ten years, has resigned (as from May 31) so that he may take over the post of Advertisement Manager for our valued monthly contemporaries, *Airways* and *The Aircraft Engineer*.

In the earlier days, when Civil Aviation was young and advertising was so inconsiderable in amount that it was not a serious commercial proposition, Mr. Dorman added to the gaiety of nations by contributing paragraphs to this paper over the initials G. D., and many readers regretted their disappearance when the need for real work in the Advertising Department prevented their continued production. All such readers, along with the staff of this paper, will wish Mr. Dorman success in his new occupation.—C. G. G.

PERSONAL NOTICES.

DEATHS.

BERTHON.—On May 20, at Ashford Hospital, Kent, Edward Brassey Berthon (formerly of the Aircraft Inspection Department), fourth son of Major-General Thomas Berthon, of Cleeve Court, Somerset, aged 57.

NICOLAY.—On May 26, at Barholm, near Stamford, as the result of a flying accident, Vincent Humphries Nicolay, Flg. Off., R.A.F.

Mr. Nicolay entered the R.A.F. with a short-service commission in March 1928 and, after a course of flying training at No. 5 F.T.S., Sealand, he was posted to No. 4 (Army Co-operation) Squadron at Farnborough. He was attached to the Central Flying School, Wittering, at the time of the accident.

FORTHCOMING MARRIAGES.

COLLINGWOOD—DAVIS.—The marriage arranged between Mr. W. A. D. Collingwood, R.A.F., and Miss Nellie Davis will take place at St. James's, Spanish Place, W., on June 5.

MARTINGELL—BROWN.—The engagement is announced between Sq. Ldr. G. H. Martingell, A.F.C., R.A.F., eldest son of the late H. R. Martingell, of Millmeade, Folkestone, and Mrs. Martingell, Westgrove, Sandgate, and Phyllis Bletsoe, only daughter of Mr. and Mrs. Harold Brown, Sywell House, Northamptonshire.

STACEY—HUTCHINSON.—An engagement is announced between Reginald Howard Stacey, late King Edward's Horse and Royal Flying Corps, elder son of Mr. and Mrs. Frederick Stacey, of Washington, Sussex, and Margaret Joan, only daughter of Mr. and Mrs. John Hutchinson, of Aldingham Hall, Ulverston.

BIRTHS.

MILLS.—On May 23, at The Old Place, Swanley, to Molly, wife of Flt. Lt. G. H. Mills, R.A.F.—a son (Derek Holroyd).

WYNNE.—On May 17, at Oakvale Nursing Home, Sheffield, to Kathleen, wife of Flt. Lt. F. R. Wynne, R.A.F.—a daughter.

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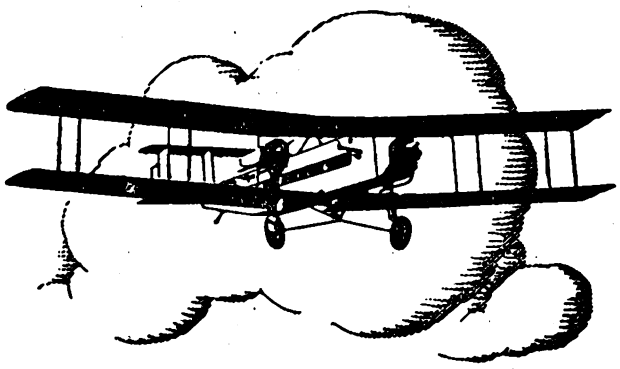

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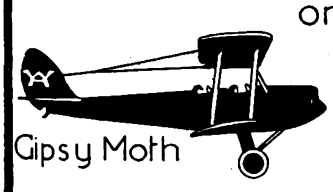

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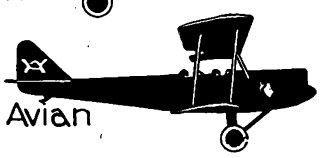

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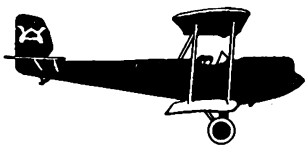

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Air Taxis Ltd., Stag Lane Aerodrome, Edgware. 'Phone: Edgware 0849.
Aerofilms Limited, Aerial Tours, Taxi Work, Aerial Photography. Air Survey. Colindale Avenue, Hendon, N.W.9. 'Phone: Colindale 6183 and 6184.
National Flying Services Ltd. (See page 1051.) Go by N.F.S. 1s. a mile; 1s. 6d. two passengers.

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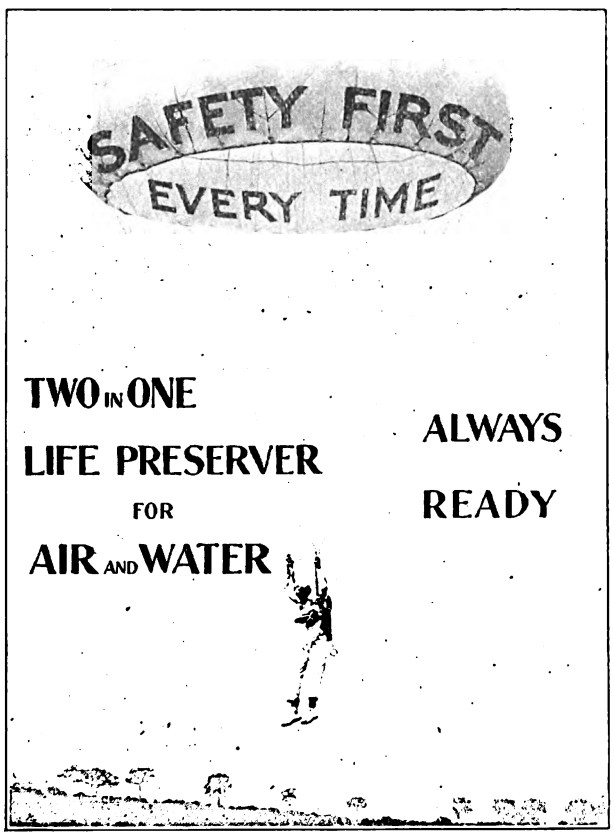

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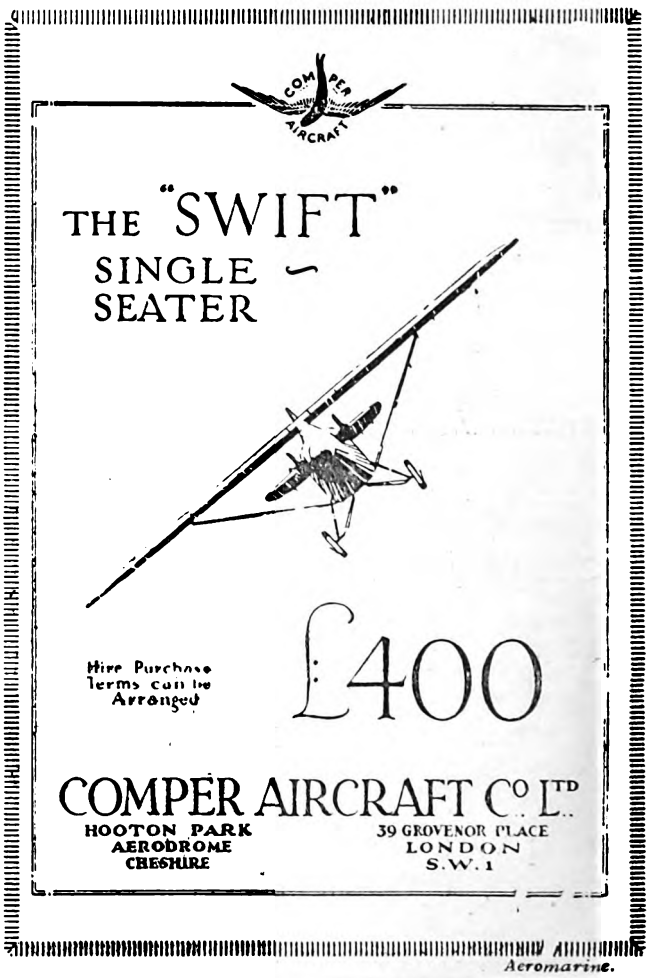

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BRIGHTON GALA WEEK.

In connection with the above, an assembly of FLYING BOATS and SEAPLANES will be held at Brighton on Monday, June 30th, or Tuesday, July 1st.

Will all owners and builders of such craft, interested, please communicate with :—

M. H. VOLK, Hon. Organiser Aviation Section, Royal York Buildings, BRIGHTON.

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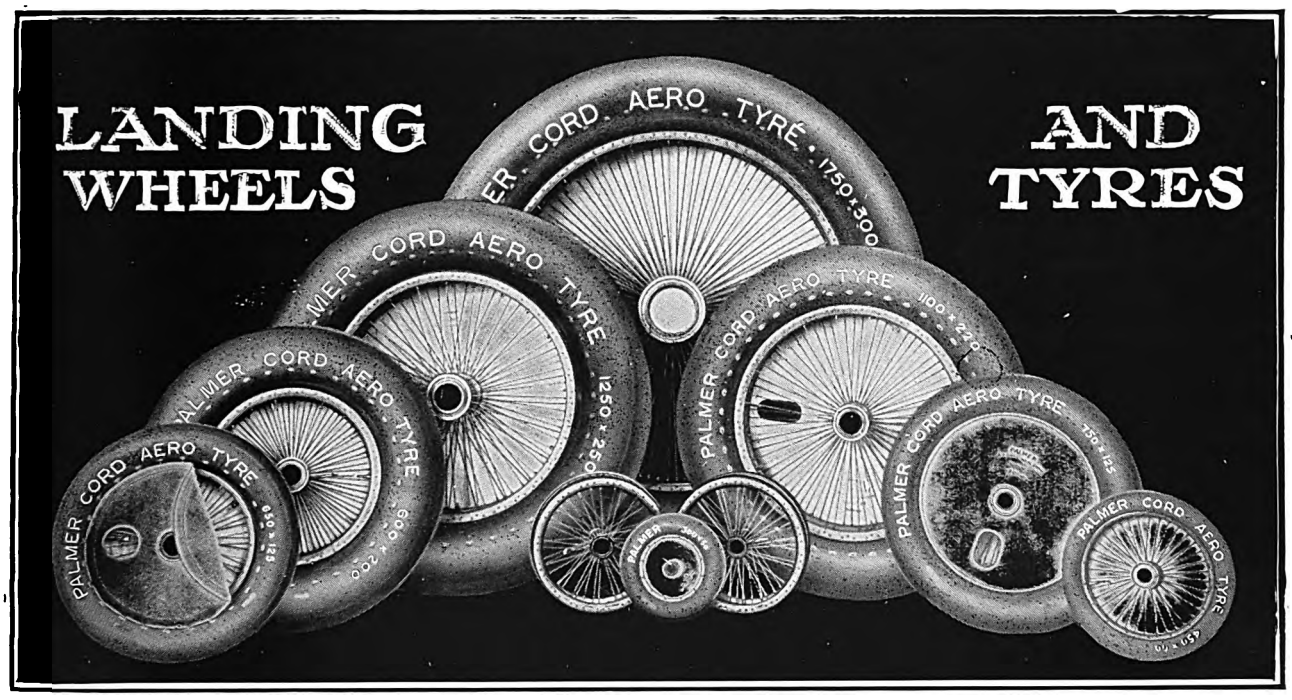
PALMER



STANDARD SIZES.

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
,,	195	130.	38.09	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575×60	21	160.	28.	Central
,,	189	150	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150	38.09	Central
600×75	21	160.	28.	Central
,,	189	150.	38.09	104/46
,,	183	120.	34.92	Central
,,	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
,,	196	178.	55.	Central
600×100	188	120.	34.92	Central
,,	301	150.	38.09	104/46
,,	333	120.	34.92	Central
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	89	178.	38.89	132/46

Tyre Size	Wheel No	Hub Length	Hub Bore	Track Line
		m/m	m/m	m m
700×100	112	150.	38.09	Central
,,	176	178	44.45	Central
,,	179	178.	55.	132/46
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
,,	336	178.	44.45	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	90	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	163	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
975×225	192	185.	60.32	Central
,,	194	185.	55.	125/60
1100×250	364	220.	60.32	Central
1250×250	314	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	305	304.8	152.4	Central
,,	306	304.8	101.6	Central
1525×325	197	304.8	101.6	Central
1750×300	139	400.	152.4	Central
,,	191	350.	150.3	Central
1750×350	193	400.	125.	Central
2000×450	363	500.	152.4	Central

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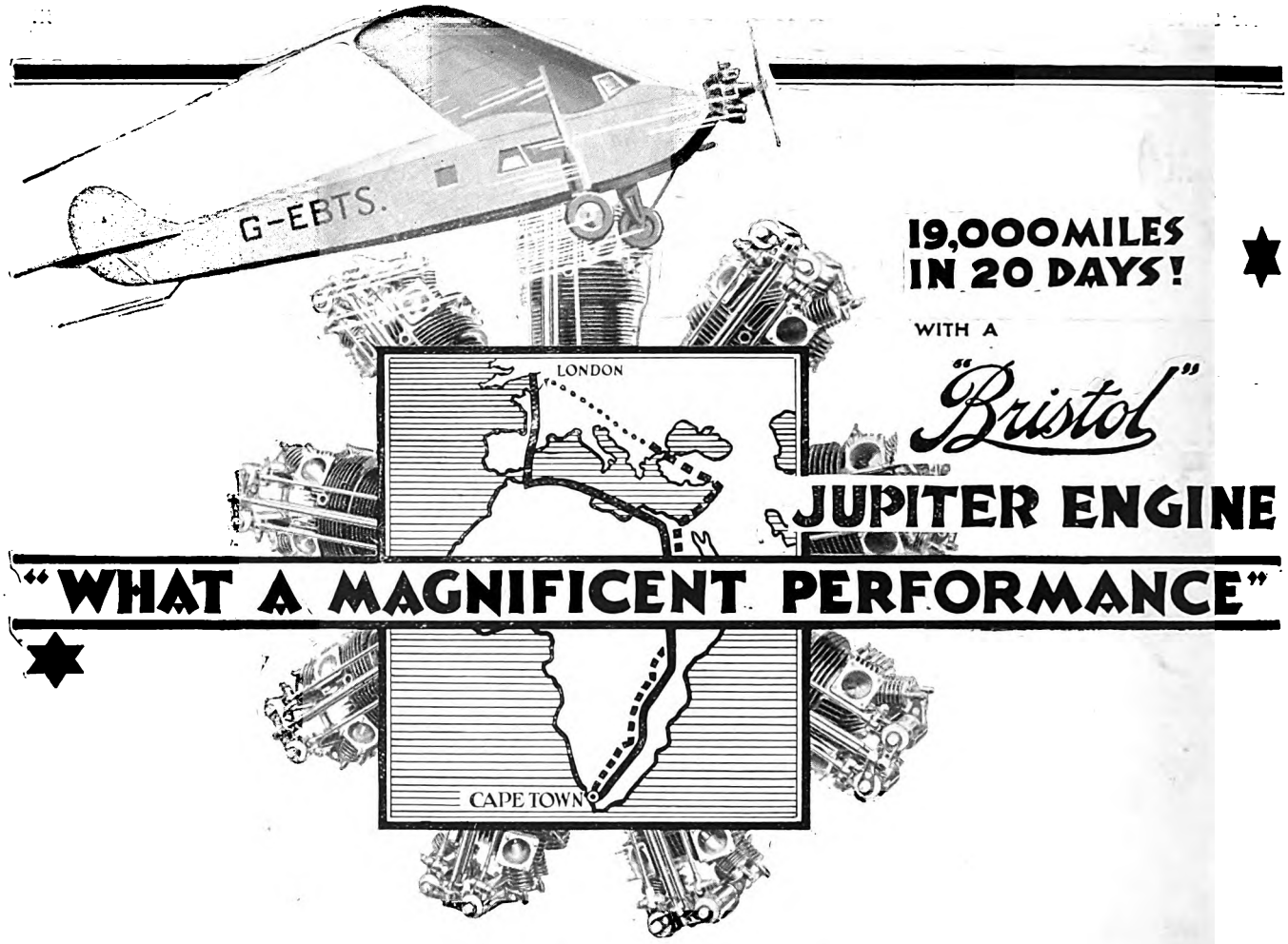

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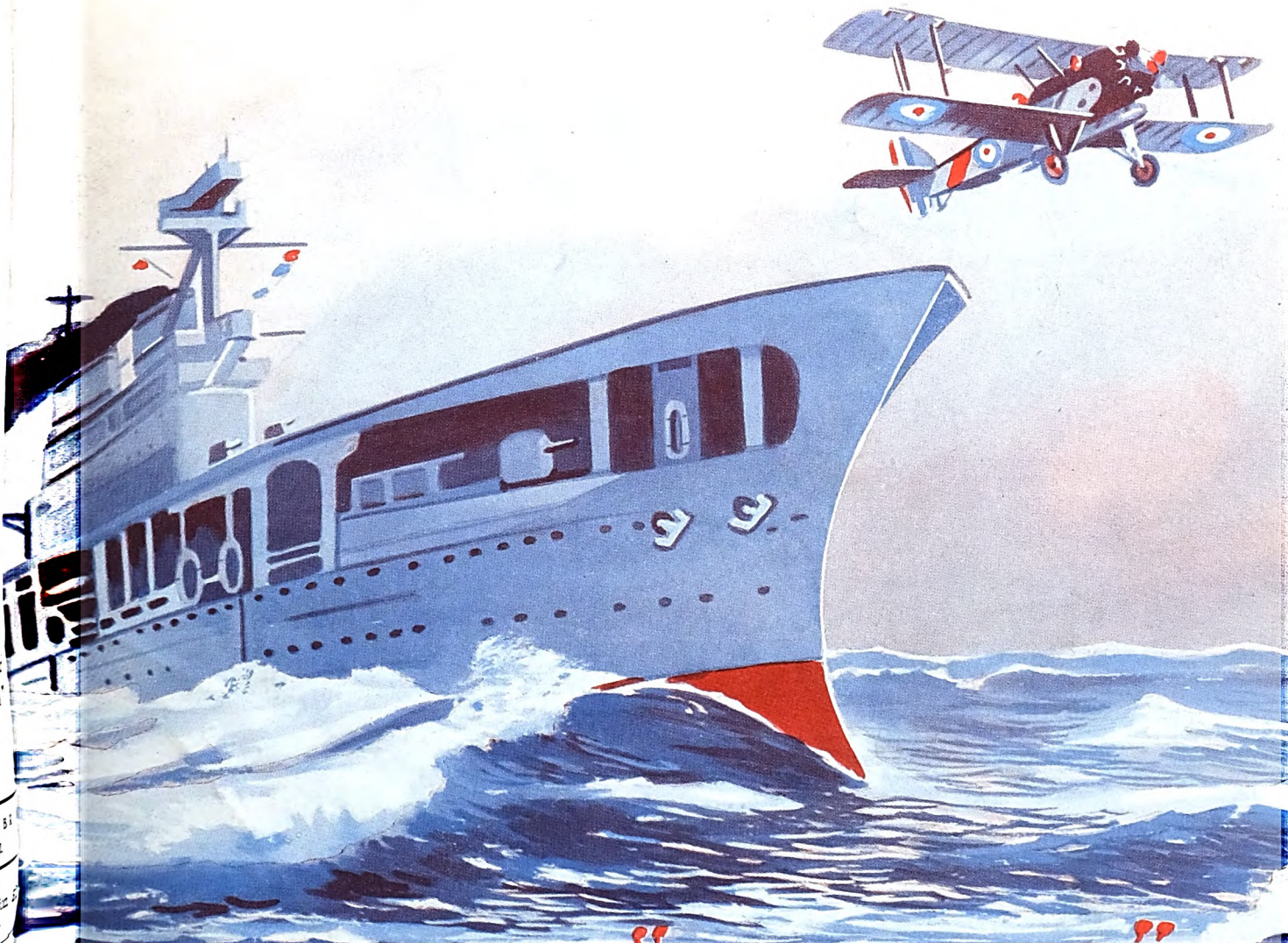
Edited by C.G.Grey



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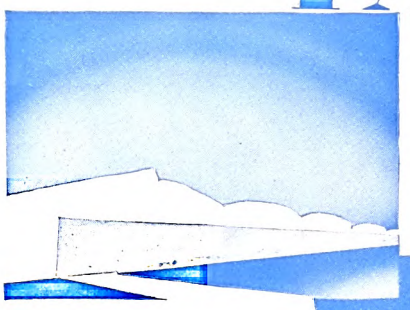

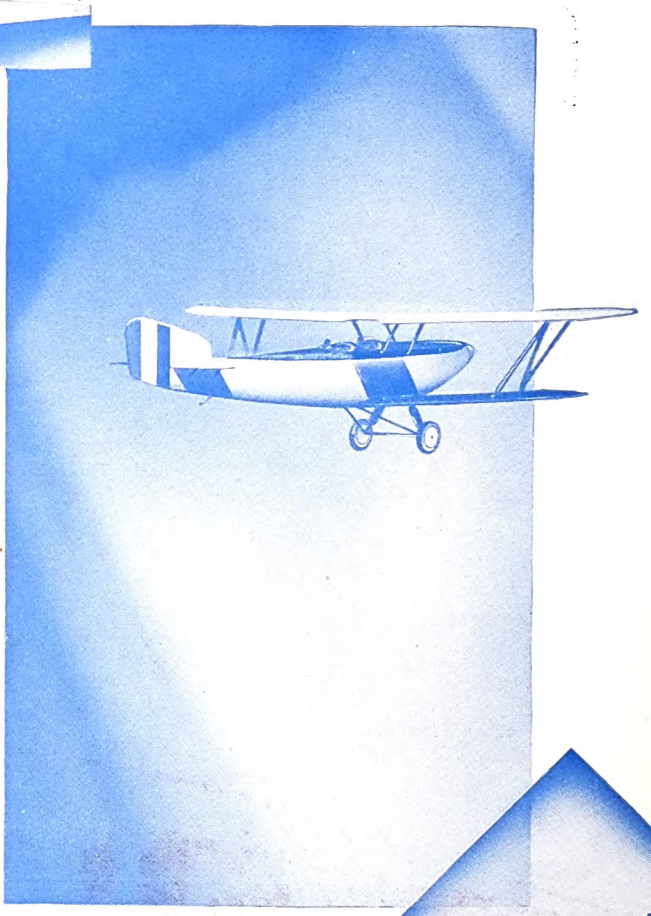

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Incorporating

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VOL. XXXVIII

No. 23.

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ON THE BRISTOL MEETING.

The ancient and honourable City of Bristol deserves to be heartily congratulated on its Air Port, and it deserved the honour of having the said Air Port opened by a Royal Prince. Considered as an aerodrome it is certainly one of the best in the country, for though it is surrounded by hills all the hills are far enough away to allow a reasonably flat approach, and they act as wind-breakers without being close enough to cause down-currents.

One has been told that the aerodrome is within ten minutes of Bristol Bridge. But one takes leave to doubt this statement, though one is prepared to admit that possibly a certain City Councillor who is a keen pilot and motorist might do the journey in the time in the early morning if there happened to be no policemen looking. Nevertheless in comparison with the aerodromes of some cities and towns in this country the Bristol Air Port is both a better aerodrome and better situated.

The actual flying at the meeting is described hereafter by Mr. Bradbrooke, so there is no need to refer to it beyond saying that considering the weather it was extraordinarily good. The thousands of spectators who gallantly came to the aerodrome through the rain and mud at any rate cannot complain that they did not see any flying. Or if they did not see it that was because too much atmosphere intervened.

The number of people who defied the weather and came to the aerodrome showed that there is intense keenness in Bristol. For though no city is more loyal, they certainly did not come all that way merely to see Prince George, whom they could have seen at very much closer quarters by stopping in the city.

When one arrived at the aerodrome on Friday one was amazed at the number of aeroplanes which had arrived from the Continent and from all parts of England in spite of very bad visibility all over the country. Those who arrived at about that time were greeted by posters of one of the local papers announcing "The Johnsons Are Here." Just what the Johnsons have to do with Bristol was not explained. And why the local paper, which is apparently allied in some way with *The Daily Mail*, should imagine that the father and mother of Miss Amy Johnson should be a vivid attraction to those people of Bristol who are interested in aviation is difficult to understand. Anyhow, such was apparently the belief, for the local paper announced that its own particular aeroplane had been sent to Hull to fetch the Johnsons, and *The Daily Mail* also, one was told, announced that *its* particular aeroplane had been sent to Hull to fetch the Johnsons. The fact was that one or other or both of these enterprising journals hired the Avro Five which is being operated by Airwork Ltd. and sent it all the way from Heston to Hull and from Hull to Bristol for the benefit of the Johnsons. Which of course is very kind of those newspapers and one hopes the Johnsons enjoyed themselves.

As a matter of fact we are getting rather too much Johnson these days. One sympathises with those people who have written to *The Times* regretting that Miss Johnson is being made into a publicity stunt, and to *The Daily Express* pointing out that they are a little bit tired of having the name of Johnson thrust in front of their eyes whenever they open their morning paper.

The Johnson situation is really rather funny. *The Daily Mail* having announced that it is presenting £10,000 to Miss Amy Johnson and *The Daily Sketch* having opened a subscription list to buy her a new aeroplane, and *The Daily Mail* having stated that it has engaged her as its Air Expert when she comes home, we shall apparently have an amusing state of affairs in which *The Daily Mail's* Expert will be flying round the country in an aeroplane provided by *The Daily Sketch*. Which of course will mean that in any case all the other papers will entirely lose interest in Miss Amy Johnson, for no paper is going into rhapsodies over the Air Expert of another paper.

One is really very sorry for Miss Amy Johnson over the whole affair, because personally she is quite a nice young woman and one does not believe that she appreciates all this

"MINE ENEMY'S DOG, THOUGH HE HAD BIT ME, SHOULD HAVE STOOD THAT NIGHT. AGAINST MY FIRE."—(SHAKESPEARE—*King Lear.*)

THE BAPTISM OF BRISTOL.—H.R.H. Prince George, against the mast on the roof, declaring the Airport of Bristol open.—(" *Aeroplane* " *photograph.*)

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hysteria. When she was first rushed into the public eye by an announcement in one or another of the papers that she intended to fly to Australia, long before she really had taken any steps towards doing so, and people in Aviation were rather inclined to jeer at her, she took the trouble to come to the office of The Aeroplane and explain that really all this premature publicity was not her fault.

She then impressed one as being seriously keen on flying for flying's sake and not as being what is commonly called "on the make," or merely out for the limelight. She wanted to do something big in aviation and she has done it, and it is a thousand pities that a newspaper should bring ridicule on the girl by trotting her parents about the country as a kind of raree show for its own publicity purposes.

At Bristol the mere mention of the name of Johnson was received as a joke. People assured one another that "Mr. Wellworth" who won the Aerial Derby was not Mr. Johnson in disguise, and they wanted to know why the Johnsons topped the bill when Mr. Will Hay was already on the aerodrome, and so forth.

What the people who really matter think of the affair was delightfully shown by a lady of some position whose car happened to be down by the machine park when the Johnsons landed. She was asked whether she would take them up to the Club house, and having left them she drove back to the people in whom she was interested at the machine park. Somebody with a daily paper mind remarked to her in an awed way "I hear that you have taken the Johnsons to the Club House," to which the lady replied "Yes, I believe I did. By the way,—Who *are* the Johnsons?"

So far as newspaper reports can be believed, one gathers that Mr. Johnson is in the fish business in Hull. No doubt he is an excellent fish salesman, but why *The Daily Mail* should regard him as a star turn in aviation passeth human understanding. Really the British public are not quite so wet as the *Mail* seems to think them.

Hereinbefore one has mentioned that the number of aeroplanes from the Continent was one of the most striking features of the meeting. Apart from our very good friend Bajac and his "Golden Ray," we had two very notable visitors in the persons of M. Bailly and M. Reginensi, who arrived in the same old Farman monoplane, very appropriately with a Bristol Titan engine, in which they have already made their historic voyages to Saigon (French Indo-China) and back, and to Madagascar and back, besides going out into the Sahara to discover and pick up the crew of another Farman who had forced landed there and been lost for several days. With them came from Paris Capitaine Bos, formerly of the French Navy and now of the French *Armée de l'Air*, and erstwhile French Air Attaché in London and quite one of the most popular of our gallant Allies. At much about the same time came Lieut. de Vaisseau Sala, the present French Air Attaché in London in his little Caudron with a 40 Salmson engine, in which he habitually flies himself between London and Paris. Altogether there could not have been a more popular group of French visitors than those who came to Bristol. And all were equally pleased to see our German and Belgian visitors.

The Bristol Aerial Derby, which Mr. Bradbrooke describes elsewhere, provided one of the most exciting finishes ever seen to a big race. Unfortunately the finishing line was distinctly in the wrong place, with the result that the machines in finishing flew right across the aerodrome as far away from the crowd as they could possibly be put.

When will organisers of meetings realise that quite the most important thing to arrange is to have the finishing line of their competitions so that the machines in finishing fly right along the front of the crowd as close as possible? They need not necessarily fly along in front of the most expensive enclosure, but rather in front of the longest side of the enclosure, where they will be seen by the most people.

People really are interested in flying in these days and their interest ought to be encouraged. The point of view of the youngest generation was beautifully put by the elder son of Mr. Herbert Thomas (who is himself at the same time about the oldest member of the Bristol Aeroplane Co. Ltd. and the youngest member of its Board of Directors). During the heats of the Bristol Derby, in which numbers of light aeroplanes were flying, Thomas Junior, whose age is somewhere about nine or ten, wanted to know what sort of speed they were doing. When he was told they were doing about 90 miles an hour, he asked contemptuously, "Then why didn't Daddy enter his Bentley?"

Manufacturers and designers of aircraft will do well to lay that remark to heart. A lot of them are still in the motor-car state of mind and regard 90 miles an hour as quite fast. In ten years' time when Thomas Junior wants an aeroplane of his own he will look on 150 miles an hour as slow. With that parting injunction one introduces the official report of the Meeting.—C. G. G.

BRISTOL IN THE RAIN.

On Saturday, May 31, His Royal Highness Prince George opened Bristol Municipal Airport in weather which showed none of the respect due to the solemnity of the occasion. The rain poured down, particularly during the ceremony, and at no time throughout the week-end was any decent weather forthcoming.

This was very hard on the organisers of the best-ordered show of the year, because although enthusiasts can appreciate good flying in any weather, the enthusiasts, as usual, are not the people with money to spend, and the crowd, while much larger than could have been expected to stand in wet grass all the afternoon, was pitiable in comparison with the effort and talent expended on their behalf for the past two or three months.

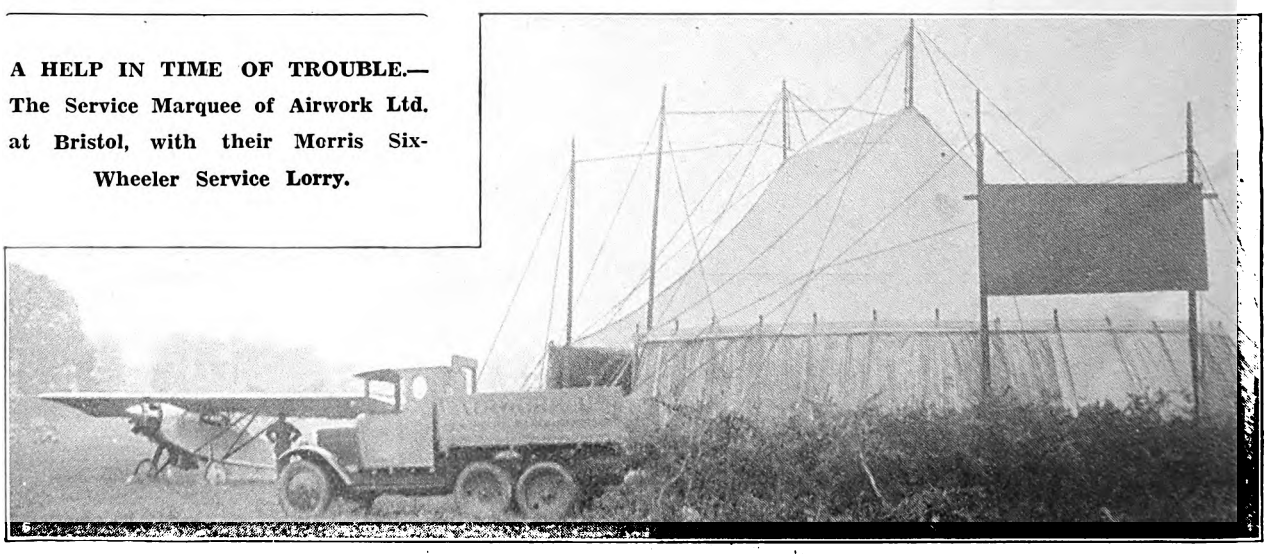
The spade-work of a show such as the Bristol Pageant is done many weeks before the event, and we call it the best organised of the year without reservation for at least two reasons. For one thing, it really extended over two days, and accidentally into a third, which implied arrangements for visiting pilots staying overnight, their transport into Bristol, etc., and automatically trebled the work required for an afternoon meeting from which everybody flies home at once. Also, Bristol was the first meeting to offer inducements to machines from abroad, and it got them to the tune of a dozen or so.

These complications merely add lustre to the general excellence of the staff work, and the aerial traffic control was the best and safest yet seen, even if the thick weather did add a spice of excitement during the racing, which was nobody's fault.

Our journey down to Bristol was a fast and pleasant one through the courtesy of Air Union, which firm sent one of its twelve-passenger Lioré et Olivier liners (two 450 h.p. Renault engines) to represent France. It is British-French week in Bristol, and it was a fine gesture of co-operation to send one of the Golden Ray fleet from Paris. Piloted by M. Robert Bajac, one of Air Union's oldest and best pilots, our party flew from Croydon to Bristol in exactly an hour on Friday morning, mostly between 3,000 and 4,000 ft. in the last interval of good weather for the whole week-end.

It was a new route for the French liner, as proven by M. Loukeneff, the second pilot, who came into the cabin to inquire the right pronunciation of Bath, as he wished to inform Croydon that we were flying over that city.

A HELP IN TIME OF TROUBLE.—The Service Marquee of Airwork Ltd. at Bristol, with their Morris Six-Wheeler Service Lorry.



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VARIETY.

At that early hour about a dozen machines had already arrived. Thenceforward they came much too fast to be catalogued in detail, but among the most interesting were the following:—

A Darmstadt cantilever biplane with Genet Major engine, piloted by Herr R. Neininger, with Herr Fischer as assistant pilot. This machine competed with a Genet engine in the *Challenge Internationale de Tourisme* last year. Its wing-surface is diminutive and seems quite incapable of lifting two large men at reasonable speed, and its streamlining is extreme. By a fine flight from Frankfurt Herren Neininger and Fischer won the Continental Air Rallye.

The Pander P2 (Gipsy engine) is a finely streamlined cantilever monoplane, which Herr Leo Lammertz flew from Cologne in one day.

The Caudron low-wing monoplane (80 h.p. Salmson), which M. Delmotte, chief Caudron test pilot, brought in on Thursday.

Two St. Hubert cantilever parasol monoplanes (Walter engine), brought from Belgium by Comte Jacques d'Ursel and Comte Arnold Looz-Corsmaren, each with a passenger. [The former presumably a relative of Ursel de Bailleul, commonly called in England Russell of Balliol, who founded that ancient college and the great English and Irish Russell families.—C. G. G.]

By the time the Pageant was well under way nearly 150 aeroplanes were in the machine park and about 40 types were represented. It must be said that, for this meeting, parasol monoplanes were immeasurably the most popular, and for large portions of the time each of this type looked like a domestic fowl extending parental protection over a numerous and dripping brood of visitors.

THE ROYAL OPENING.

After arriving at Filton by air, and performing other duties of Royalty during the morning, Prince George came to Whitchurch at 15.00 hours with a long escort of motor cars. Mr. Walter Bryant, Lord Mayor of Bristol, requested His Royal Highness to declare the airport open, and said that the City of Bristol fully intended to reproduce in the air her adventurous maritime history. He looked to the day when the airport should be the Gateway of the West and a centre of air traffic in mails, passengers and goods between Ireland, Europe and America.

Prince George replied that but little imagination was needed to visualise a busy future for the airport. Like his brothers, he used flying a lot in his concerns and knew something of its value. Already the West of England was known as a centre of the Aircraft Industry, and the home of the famous Bristol Fighter of war fame, besides other world-famous engines and aircraft. He hoped that the citizens of Bristol would be among the first to reap the advantages of air traffic to all parts of the world and use it in the way which had made the city famous in marine venture.

The speeches were spoken into the microphone on the roof of the club-house and broadcast to all enclosures by the clearest broadcasting mechanism one has yet heard at such an event. [Which were made by Philips, the lamp people, who are a Dutch firm.—C. G. G.]

THE PAGEANT.

The parade of aircraft was lined up ready to file past the expensive enclosures, take-off and fly a circuit. The distance to the cheap enclosure was so great that its occupants got no close-up view on the ground, which was a great pity, but perhaps excusable under the circumstances. The parade was splendidly representative of types and must have been one of the most interesting events of the show to those at all interested.

To many adults each aeroplane is merely a curious structure, slightly queerer than its predecessor, but always with a noisy engine in front. The younger generation is a far more avid collector of details, which are fondly remembered and argued about. On Saturday the parade was a veritable motile museum, and included the following:—

Comper Swift (A.B.C. Scorpion, 40 h.p.), D.H.53 (Bristol Cherub, 32 h.p), Klemm (Salmson, 40 h.p.), Bluebird (Gipsy, 100 h.p.), Moth (Gipsy, 100 h.p.), Avian Sports (Cirrus-Hermes, 115 h.p.), Parnall Elf (Cirrus Hermes, 115 h.p.), Puss Moth (Inverted Gipsy III, 120 h.p.), Breda (Gipsy, 100 h.p.), Desoutter (Cirrus Hermes, 115 h.p.), Avro 504k (Le Rhone, 110 h.p.), Spartan (Cirrus III, 95 h.p.), Handley Page "Gugnunc" (Armstrong Siddeley Mongoose, 160 h.p.), Darmstadt (Genet Major, 110 h.p.), Pander P2 (Gipsy, 100 h.p.), Caudron (Salmson, 80 h.p.), Lioré et Olivier (Two Renault, 450 h.p.).

Among the types on the ground but not represented in the parade were Handley Page 12-seater (two Napier Lions, 450 h.p.), Siskin (Armstrong Siddeley Jaguar, 450 h.p.), Bristol Bulldog (Jupiter, 500 h.p.), Westland Wapiti (Jupiter, 500 h.p.), Fairey IIIF (Napier Lion, 550 h.p.), Blackburn Lincock (Armstrong Siddeley Lynx, 220 h.p.), D.H.9, (A.D.C. Nimbus, 300 h.p.), Farman monoplane (Bristol Gnome-Rhone Titan, 240 h.p.), Caudron Parasol (Salmson, 40 h.p.), Romeo 5 (Fiat, 80 h.p.), Widgeon (Armstrong Siddeley Genet, 85 h.p.; Cirrus III, 95 h.p., and Cirrus Hermes, 110 h.p.), Bristol Brownie (Bristol Cherub, 32 h.p.), St. Hubert (Walter Vega, 65 h.p.), Avro V (three Genet Majors), Fokker Universal (Wright Whirlwind, 200 h.p.), D.W.1 (Hispano-Suiza, 170 h.p.), Avro Baby (Cirrus I, 60 h.p.).

THE OPENING CEREMONY.—His Royal Highness being cheerful under difficulties.

Sq. Ldr. Tom Harry England demonstrated the Handley Page machine which was entered for the Guggenheim Safety Competition and showed that remarkable results had been achieved in speed range and controllability. Under inspection on the ground the machine appears obviously too shot through with gadgetry to be practical although its ingenuity is beyond question. It was built for a competition, which it only just failed to win, so its commercial value may rather be expected to end there.

Mr. W. K. Kilsby, of the Bristol and Wessex Aeroplane Club, nobly drove his Austin through the inevitable barrage of flour bombs aimed from above by Mr. J. G. D. Armour in a Moth and S. A. Thorn in the Avian Sports. The accuracy of the bombing was rather remarkable this time and Mr. Kilsby only avoided direct hits by tactical driving which was slightly harder on the car than any damage from the missiles could have been.

Mr. Thorn aerobated nobly and well through the rain, and Mr. Armour did some excellently crazy flying in a Moth. His landings, sideslipped right down to the last foot before stalling to earth, were marvels of judgment and always brought him exactly alongside the control tent.

Three Siskins of No. 19 (Fighter) Squadron from Duxford, did some close formation flying slightly marred by a little engine trouble in one of the machines which prevented the pilot from keeping exact position at times.

THE AERIAL DERBY.

The three heats of the Bristol Aerial Derby had been run off on Friday, and the three first home in each heat flew in the final on Saturday afternoon. The start was delayed because of rain and thick mist over the turning points, but at last the nine machines got away, starting with the D.H.53, flown by Flt. Lt. T. B. Bruce, who had 13 min. .02 secs. start from the scratch machine, which was a Bristol Bulldog flown by Mr. C. F. Uwins. The distance was one lap of the 32-mile course

Mr. Wilfred Dancy is to be congratulated on the general accuracy of his handicapping. Eleven and a half minutes after Mr. Uwins had roared into the thick weather to the eastward Sq. Ldr. Probyn's good, if old, Westland Widgeon (Genet engine) appeared through the western obscurity hotly attended by six more of the starters. Within four seconds after he passed the finishing line he was followed by Mr. E. B. W. Bartlett (assistant instructor of the Bristol

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THE MOST DISTANT VISITOR.—The Ultra-streamlined Darmstadt (Armstrong Siddeley Genet Major).

and Wessex Aero Club) in a Moth (Cirrus II), Mr. R. G. Cazalet in his Widgeon (Hermes), Mr. Uwins, in the Bulldog (Jupiter), Mr. Store in the Breda (Gipsy), Mr. F. R. Matthews in a Moth (Gipsy), and Miss Winifred Brown in an Avian (Cirrus II.) Herr Neininger in the Darmstadt followed within eight seconds, having had only 2 min. 32 secs. start on the Bulldog. As Mr. Cazalet had failed to round the Filton mark properly the three prizes went as follows: Sq. Ldr. Probyn, first, the Cup and £100; Mr. Bartlett, second, £50; and Mr. Uwins, third, £25.

[Jolly hard luck on Mr. Cazalet who has been a most persistent and consistent amateur air-racer for the past two or three years and has not won anything like the number of races which he has deserved to win.—C. G. G.]

Mr. Hubert Broad in his aerobatic Moth, G-ALLT, treated the crowd to some of his usual splendid inverted flying. And Mr. Blake did some of his vertical ascending spins, or flick rolls, (twice and a half round) in the Blackburn Lincock, which are about the most effective trick yet seen in the air.

The S.B.A.C. Cup race, for machines of associated light aeroplane clubs, had to be cancelled owing to the weather, as some of the turning points were invisible even to the custodians thereof.

Evening Diversions.

That evening, at a dinner by the Bristol and Wessex Aeroplane Club, Mr. A. H. Downes-Shaw proposed the Royal toast, and another to the visitors, coupled with the names of Mr. Handley Page, M. Bouderie and Mr. Alan Goodfellow.

Mr. Handley Page replied in his usual felicitous vein. He apologised to the visitors from abroad for being intelligible in one language only—and not always in that one when he was reported in The Aeroplane—and congratulated one and all on the inauguration of the Bristol Air Port being so successful that every visitor had to take some of it away with him. It was no novelty to find pioneer spirit in Bristol, and the Bristol and Wessex Club was a fine example of adventurous traditions well upheld. It was not in 50 per cent. subsidies that airmindedness lay. People must fly themselves—in slotted machines, of course—and realise that the motor-car had reached its limit. Sensible people already knew that, and travelled by air to avoid the annoyances of motor travel, which he was in a position to know, having come by motor.

M. Bouderie, of the Air Union, replied briefly with thanks for the reception given to himself and his colleagues.

Mr. Goodfellow commiserated feelingly with the Bristol Club Committees whose work had been ruined by the rain. He knew the months of effort entailed, and offered the sincere thanks of all visiting pilots for the admirable arrangements that had been made for them. He congratulated Bristol and the West Country on their excellent showing in the Aerial Derby, in which two Widgeons from Yeovil, a Bulldog from Filton, and a Bristol Club Moth had been the first four over the line.

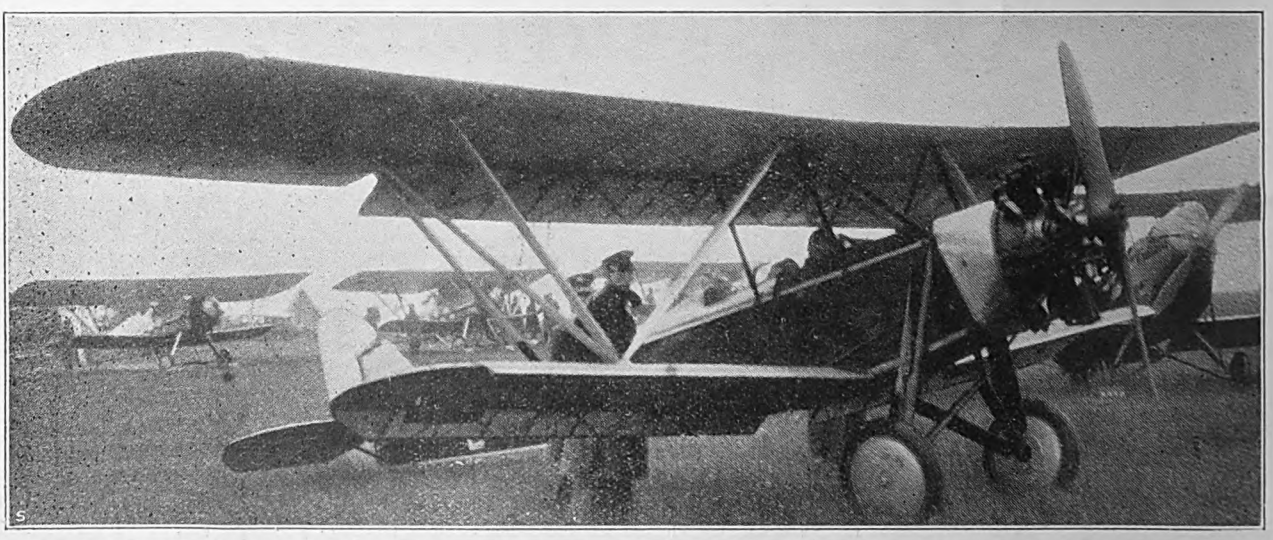
Mr. Handley Page distributed the prizes during the dance which followed, which dance was given by the Brolac Athletic Club, which is composed of the employees of John Hall and Sons Ltd. In addition to the prizes for the Bristol Derby he was called on to present the Rallye Cup to Herr Neininger, and the £15 which went with it. This winner was loudly applauded, for the fine flight from Frankfurt and for a very sporting effort in the Derby under rather a heavy handicap.

M. Jacques Mans, in a St. Hubert monoplane, of Belgian registry, was awarded the second prize.

Special gifts of silver cigarette boxes were presented to M. Robert Bajac, pilot of the Rayon d'Or liner, in recognition of his contribution to aviation during his long service, and in appreciation of his attendance at the Pageant; and to M. Delmotte, Caudron test pilot, for a fine flight from Paris.

Dancing continued until Sunday morning. Except for a few of the wise, such as Miss Spooner who flew to London in the clear early morning, the assembly remained fog-bound at the airport until afternoon.

The impromptu lunch was one of those sights which adds spice to aviation. Damp pilots and passengers ate what sandwiches they could and wrapped up more for the journey,



THE GUGNUNC.—The Handley Page Ultra-slotted Biplane (Armstrong Siddeley Mongoose), which nearly won the Guggenheim Competition.

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if and when it became possible. Mr. Handley Page spread a large piece of paper for his provision, and during his search —no doubt for a slotted bun with jam in it—his wrapping disappeared and eventually flew to Croydon round the ham sandwiches of M. Bajac. M. Marcel Desoutter, we note, likes cakes with icing.—F. D. B.

The arrangements for service and aid to all and sundry in matters mechanical was excellently looked after by Airwork Ltd., of Heston. A tent well supplied with spares for Moth aircraft and Gipsy engines, besides other of the most used varieties, was in the machine park and the Airwork Service lorry gave mobile assistance when needed. Members of the De Havilland mechanical staff used the service tent as their base.

Further arrangements are being made by the Bristol Corporation for a permanent service station operated by Airwork Ltd. at the Bristol Airport, at which major overhauls and repairs will be done for all and sundry,—on entirely friendly terms with the Bristol Club and with Merlyn Motors Ltd., who are the local agents for Moths, Compers, and such like.

The one saddening feature of the meeting was the absence of the staff of Pratt's Motor Spirit. Apparently there is some sort of agreement between the Big Chiefs of the petrol firms by which they bind themselves to do or not to do certain things in a business way. Because of some breach of this agreement Pratt's were penalised and were not allowed to go to Bristol. The result was that pilots who wanted Pratt's could not get it, and, sadder still, the pleasing presences of Flt. Lt. Rose and Mr. Handstock were missing from the aerodrome and from the subsequent parties. Moreover, the public did not see the elegant flying of Flt. Lt. Rose, which is always so entertaining. One ventures to suggest that if such a breach happens again a cash fine would meet the case better, and would not interfere with the liberty of the subject in a purely personal capacity.

THANKS.

The organisers of the Bristol International Air Pageant, which was held on May 31, wish to express to all visiting pilots their great appreciation of the manner in which competitors, demonstrators and visitors enabled the programme to be carried through, in spite of the unfortunate weather conditions. The fact that the curtailed programme was completed was mainly due to the cheerful co-operation and spirit of endurance of the visiting pilots, to whom weather conditions appeared to be of small importance.

THE CORRECT METHOD.

Sir Alfred Hollis, the new Governor of Trinidad, made an aeroplane flight round the island on Mar. 25 and inspected the damage done to an extensive area by bush fires.

ANOTHER RECORD.

A *Reuter* telegram from Glendale, Cal., states that Captain Roscoe Turner has succeeded in lowering the record for a non-stop westward flight across the American Continent. Captain Turner is stated to have done the flight in 18 hrs. 43 min. 34 sec. There is no mention of the starting place of the flight which apparently finished at Glendale. The record was previously held by Captain Frank Hawks, who flew on June 27, 1929, from New York to Los Angeles in 19 hrs. 10 min. 32 secs.

THE KING'S BIRTHDAY HONOURS.

The King's Birthday Honours List contains the following names which are connected with Aviation:—

BARONET:—Royce, Frederick Henry, Esq., O.B.E., M.I.M.E., M.I.E.E., M.I.A.E., Founder, Director and Chief Engineer of Rolls-Royce, Limited.

KNIGHT:—McAnally, Henry William Watson, Esq., C.B., J.P., Principal Assistant Secretary, Air Ministry.

THE ORDER OF THE BRITISH EMPIRE, C.B.E. (*Civil Division*):—Johnson, Miss Amy, in recognition of her outstanding flight to Australia.

O.B.E. (*Civil Division*): Downes-Shaw, Archibald Havergal, Esq., Chairman of the Bristol and Wessex Light Aeroplane Club.

A ROYAL SPORTSMAN.

His Royal Highness The Prince of Wales has entered a Hawker Tom-Tit (Armstrong Siddeley Mongoose engine, 165 h.p.) for the King's Cup Race. The pilot will be Sq. Ldr. D. S. Don, M.V.O., and the navigator will be Flt. Lt. H. W. Heslop,—both of No. 24 Communication Squadron, Northolt.

A ROYAL VISIT TO YEOVIL.

On May 30 His Royal Highness the Prince of Wales landed on the Westland Aircraft Works aerodrome in his private Moth piloted by Sq. Ldr. Don. Accompanying him was Admiral Sir Lionel Halsey piloted by Flt. Lt. Fielden.

The Prince arrived at 18.00 hours on his way from Torquay to Hendon, and was quite unexpected. The works were closed, but Mr. R. A. Bruce, Managing Director, Flt. Lt. Paget, and Mr. Byron were on hand to welcome the Royal party and senior members of the staff were rapidly collected to take the Prince for a tour of the shops, in which his Royal Highness was naturally interested because he has flown so many thousands of miles in Westland Wapitis with Bristol Jupiter engines.

Before leaving about an hour later the Prince and his party were entertained to an impromptu tea in Mr. Bruce's office.

DON'T FLY LOW.

The Air Ministry draws attention to the fact that low flying in the past has considerably interfered with the control of the horses at two great occasions. The notices read:—

Rehearsals for the Aldershot Tattoo are taking place daily at the Rushmoor Arena, N.W. of Aldershot. The Tattoo will be held from June 17 to 21 inclusive. Pilots of aircraft are requested to avoid flying low in this vicinity during the whole of the above period.

Horse racing will take place at the Epsom Downs Racecourse from June 3 to 6 inclusive. Pilots of aircraft are requested to avoid flying in the vicinity of the Racecourse at a lower altitude than 2,000 feet, when racing is in progress.

IMPORTANT DATES.

June 7—9.—Gliding Meet at Itford Hill.
June 9.—N.F.S. Meeting at Reading.
June 9.—Northamptonshire Aero Club's Meeting at Sywell.
June 10—15.—F.A.I. Conference, Paris.
June 14.—Manston Garden Party.
June 14.—Royal Tournament at Olympia ends.
June 19.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gywnn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
June 30.—Flying-boat and Seaplane Assembly at Brighton.
July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).
July 9—12.—R.A.F. Athletic Championships at Uxbridge.
July 13.—N.F.S. Meeting at Leeds.
July 19.—Hanworth Garden Party.
July 20—Aug. 7.—International Touring Competition, starting from Berlin.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6.—Official opening of Mr. Lindsay Everard's private aerodrome at Ratcliffe, Leicester.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

THE AIR PORT OF THE WEST.—The Club House, the Main Sheds, and, on the right, the Showroom of Merlyn Motors Ltd.

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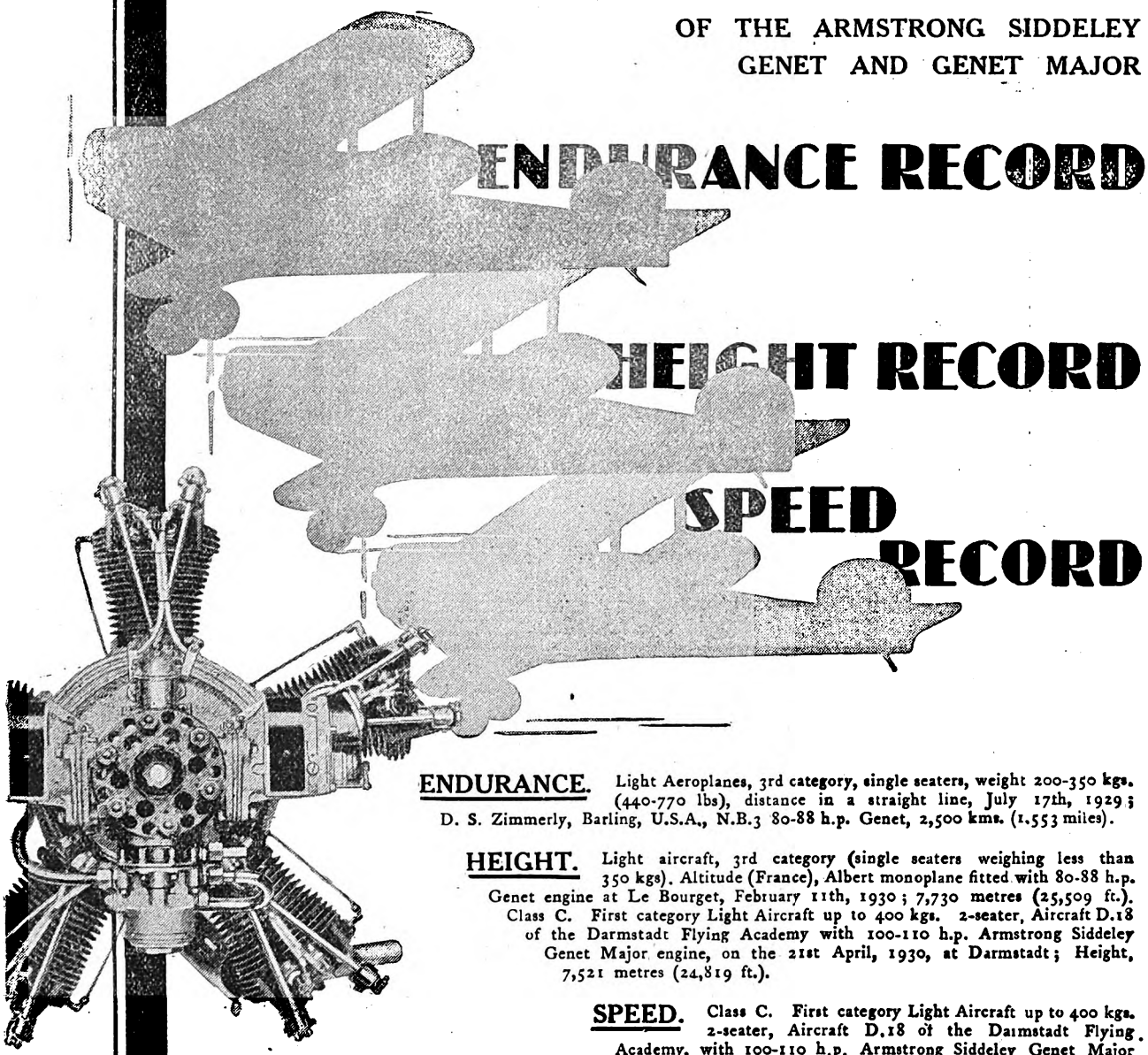
4 WORLD'S RECORDS

OF THE ARMSTRONG SIDDELEY GENET AND GENET MAJOR



ENDURANCE. Light Aeroplanes, 3rd category, single seaters, weight 200-350 kgs. (440-770 lbs), distance in a straight line, July 17th, 1929; D. S. Zimmerly, Barling, U.S.A., N.B.3 80-88 h.p. Genet, 2,500 kms. (1.553 miles).

HEIGHT. Light aircraft, 3rd category (single seaters weighing less than 350 kgs). Altitude (France), Albert monoplane fitted with 80-88 h.p. Genet engine at Le Bourget, February 11th, 1930; 7,730 metres (25,509 ft.). Class C. First category Light Aircraft up to 400 kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 21st April, 1930, at Darmstadt; Height, 7,521 metres (24,819 ft.).

SPEED. Class C. First category Light Aircraft up to 400 kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy, with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 23rd April, 1930 at Darmstadt; 214.848 kms. (134.3 miles) per hour over 100 kms (62.5 miles).

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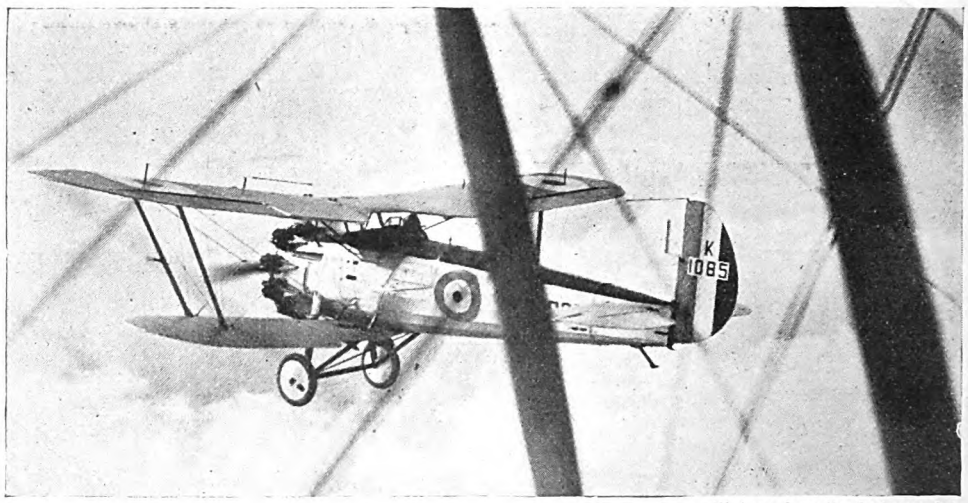

—("Aeroplane" photograph.)

Pilots speak with enthusiasm of the "Bristol" Bulldog All-Steel Single-Seater Fighter because it combines the splendid combination of a high performance aeroplane capable of every "stunt" and manœuvre, yet easily flown by any pilot. The all-steel structure also gives strength with lightness, reduces maintenance cares and makes repair a matter of simplicity and ease.

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, May 27.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—Flt. Lt. I. E. Brodie is granted a perm. comn. in this rank (May 1).

The following are granted perm. comns. as Plt. Offs. on probation with effect from and with seniority of May 19:—363771 Sjt. W. C. Sheen. 363737 Sjt. H. V. Satterly, 363571 Sjt. D. D. Christie.

Lt. J. P. Domvile, R.A.R.O., is granted a S.S. comn. on the Supplementary List as a Flg. Off. with effect from May 16 and with seniority of July 16, 1921.

The following Plt. Offs. are promoted to the rank of Flg. Off.:—J. E. Beynon (Mar. 14); G. S. King (Apr. 8); M. P. O'Reilly (Apr. 8); J. D. H. Slade (Apr. 12); R. I. Johnson (Sec. Lt., 67th Fd. Bde., R.A., T.A.) (May 2).

Plt. Off. on probation F. N. Hemphill relinquishes his S.S. comn. on account of ill-health (May 28). The S.S. comn. of Plt. Off. on probation E. H. Jennings is terminated on cessation of duty (Mar. 27).

STORES BRANCH.—Flg. Off. A. Amy is transferred to the Reserve, Class B (May 25).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—I. R. Scott (May 12); E. Cramp (May 15). Flg. Off. J. C. Joynt is transferred from Class B to Class C (Apr. 20).

Appointments.

Week ending June 2.

GENERAL DUTIES BRANCH.—Wing Commander J. A. G. De Courcy, M.C., to H.Q., Coastal Area, for Engineer Staff Duties, 14/5.

Flight Lieutenants E. H. D. Spence, to R.A.F. Training Base, Leuchars, 27/4. N. Young, to No. 441 (F.S.R.) Flight, 27/4. G. C. A. Armstrong, to No. 1 F.T.S., Netheravon, 18/5. R. E. Meek, to R.A.F. Base, Calshot, 20/5. T. G. Bird, to No. 16 Sqdn., Old Sarum, 26/5. A. H. J. Howlett, to R.A.F. Depot, Uxbridge, 16/5. J. H. C. Wake, to H.A.D., Henlow, 19/5. C. Guppy, to Oxford University Air Sqdn., 21/5.

Flying Officers S. F. Cole, to No. 1 School of T.T. (Apprentices), Halton, 29/4. H. G. Wisher, P. J. Stapleton, and W. L. Freebody, to H.A.D., Henlow, 26/4. R. J. Cooper, to No. 4 F.T.S., Egypt, 17/5. M. Griffiths, to No. 607 Sqdn., Usworth, 6/5. P. MacG. Watt, to C.F.S., Wittering, 14/5. J. P. Domvile, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn., 16/5.

Pilot Officers K. A. K. MacEwen, to No. 19 Sqdn., Duxford, 8/5. G. H. Clarke, to No. 17 Sqdn., Upavon, 16/5.

MEDICAL BRANCH.—Squadron Leader A. Briscoe, to R.A.F. Depot, Uxbridge, 30/4.

Flight Lieutenant G. W. McAleer, to H.A.D., Henlow, 19/6.

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident at Barholm, Lincolnshire, to an Avro machine of the Central Flying School, Wittering, on May 26, Fl.-Off. Vincent Humphries Nicolay was killed and Fl.-Off. Philip Francis Luxton, the pilot of the aircraft, was dangerously injured.

The King's Birthday Honours.

The following officers and men of the Royal Air Force are among those on whom honours have been conferred on the occasion of His Majesty's birthday:—

THE ORDER OF THE BATH, K.C.B. (*Military Division*):—Air Vice-Marshal David Munro, C.B., C.I.E., M.B., Ch.B., F.R.C.S. (E), R.A.F. (Retired).

THE ORDER OF THE BRITISH EMPIRE:—

C.B.E. (*Military Division*):—Whittingham, Wing Cdr. Harold Edward, M.B., Ch.B., F.R.F.P.S. (G), M.R.C.P. (E), D.P.H., D.T.M. and H.

O.B.E. (*Military Division*):—Millet, Wing Cdr. W.; Leedham, Sq. Ldr. Hugh; Bishop, Sq. Ldr. Alan George, A.F.C.

M.B.E. (*Military Division*):—Bailey, Flt. Lt. Sidney James; Box, No. 472 S-M. Alfred, 1st Class; Lamdin, No. 798 S-M. Frank, 1st Class; Fears, No. 7677 S-M. Laurence Richard, 1st Class.

The British Empire Medal:—*For Meritorious Service*: No. 358497 L-AC. Arthur Horace Street; No. 2172 Orderly Room Sjt. Fazal Ahmed, Aden Protectorate Levies.

Bar to Air Force Cross: Orlebar, Sq. Ldr. Augustus Henry, A.F.C.

Air Force Cross: Lees, Sq. Ldr. Alan; Lock, Flt. Lt. Henry George Watts, D.F.C.; Wardle, Flt. Lt. Alfred Randles.

Royal Red Cross (*First Class*): Watt Miss Katherine Christie, Matron, Princess Mary's R.A.F. Nursing Service, in recognition of exceptional devotion and competency displayed in Royal Air Force hospitals at home and in 'Iraq.

Royal Red Cross (*Second Class*): Hunter, Miss Esther Wilson, Sister, Princess Mary's R.A.F. Nursing Service, in recognition of special devotion and competency in the performance of nursing duties in the Palestine General Hospital, Sarafand.

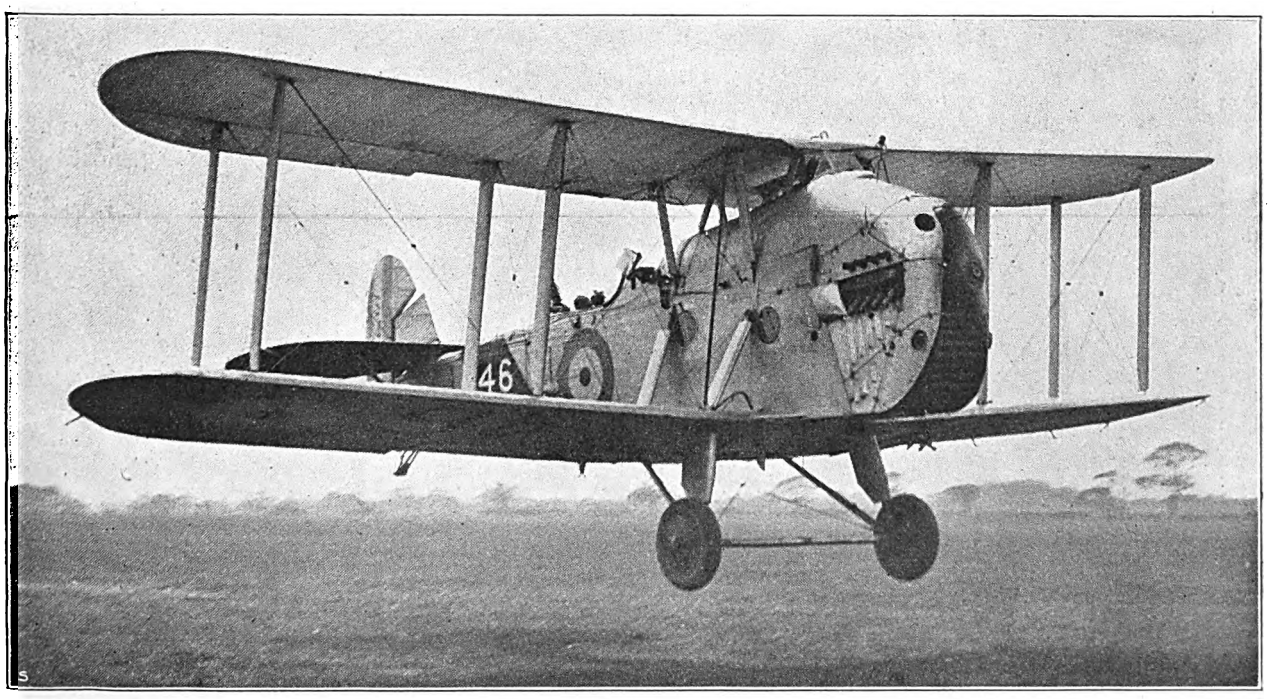
The Royal Levée.

By command of the King a Levée was held at St. James' Palace on June 2 by the Prince of Wales on behalf of His Majesty.

Among those in attendance upon His Royal Highness was Air Marshal Sir Edward Ellington, Principal Air Aide-de-Camp.

The following officers of the R.A.F. were among those presented to the Prince of Wales by the First Lord of the Admiralty:—

Bradbury, Flt. Lt. John, on appointment; Buckeridge, Sq. Ldr. Norman; Chappell, Sq. Ldr. Roy, M.C., on promotion; Cooke, Wing Cdr. Gilbert, D.F.C., A.F.C., on promotion; Joubert de la Ferté, Air Cmdre. Philip, C.M.G., D.S.O., on appointment to command No. 25 Group, R.A.F.; de Satgé, Plt. Off. Martin (presented by his father, Lt.-Col. Henry de Satgé, C.M.G., D.S.O.); Dowding, Air Vice-Marshal Hugh, C.B., C.M.G., on promotion and on appointment to Command of Fighting Area, R.A.F.; Edmonds, Grp. Capt. Charles, D.S.O., O.B.E., on promotion; Fellowes, Air Cmdre. Peregrine, D.S.O., on promotion and on appointment as Director of Personal Services, Air Ministry; Findlay, Sq. Ldr. J. Lloyd, M.C. (presented by the High Commissioner for New Zealand); Fowler, Grp. Capt. Ivor, A.F.C., on promotion; Grace, Flt. Lt. Charles, on appointment; Grenfell, Sq. Ldr. Eric, A.F.C., on promotion; Heslop, Flt. Lt. Herbert, on appointment; Hull,



COAST DEFENCE.—A Blackburn Blackburn (450 h.p. Napier Lion engine) deck-landing machine. The Blackburn is the equipment of several Fleet Spotter Reconnaissance Flights, R.A.F. —(*"Aeroplane" photograph.*)

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Flt. Lt. Allan, on appointment; Mellersh, Flt. Lt. Francis, A.F.C., on appointment; Mitchell, Air Cmdre. William, C.B.E., D.S.O., M.C., A.F.C., on promotion and on appointment as Director of Training, Air Ministry; Nanson, Grp. Capt. Eric, C.B.E., D.S.C., A.F.C., on promotion; Nicholl, Grp. Capt. Hazelton, C.B.E., on promotion; Pattinson, Grp. Capt. Lawrence, D.S.O., M.C., D.F.C., on promotion; Primrose, Grp. Capt. William, D.F.C., on promotion; Reid, Flt. Lt. Harry, D.F.C., on appointment; Richardson, Flt. Lt. George, on appointment; Rowe, Flt. Lt. Frank, on appointment; Sanderson, Flt. Lt. Alfred, D.F.C., on appointment; Spence, Flt. Lt. Edgar, on appointment; Studd, Sq. Ldr. Theodore, D.F.C., on promotion; Sugden, Sq. Ldr. Ronald, A.F.C., on promotion; Tattersall, Flt. Lt. Alfred, on appointment; Thornton, Flt. Lt. Henry, on appointment; Vernon, Flt. Lt. Frederick, on appointment; Welsh, Grp. Capt. William, D.S.C., A.F.C., on promotion; White, Sq. Ldr. Hugh, on promotion; Wincott, Flt. Lt. Cyril, on appointment.

The Day Bomber Squadron Competition.

The result of the Day Bomber Squadrons Individual Tests which were held recently is as follows:—(1) No. 12 (Bomber) Squadron, (2) No. 207 (Bomber) Squadron, (3) No. 33 (Bomber) Squadron, (4) No. 35 (Bomber) Squadron, (5) No. 100 (Bomber) Squadron.

No. 12 (Bomber) Squadron is stationed at Andover and is commanded by Sq. Ldr. F. H. M. Maynard, A.F.C. It is equipped with the Fairey Fox.

The Sassoon Trophy Competition.

The annual competition between Fighter Squadrons of the Air Defence of Great Britain for the Sassoon Trophy will not take the same form this year or in future that it has taken in the past.

In previous years this competition has consisted of a race between one representative of each of the Fighter Squadrons with the machines handicapped according to type. Last year an additional handicap was placed on the competition by means of a competition among the ground crews of the machines.

The authorities have come to the conclusion that a contest of more value in promoting efficiency could be devised and Sq-Ldr. the Rt. Hon. Sir Philip Sassoon, who presented the Trophy, has agreed that a change shall be made.

Officers' Leave.

An Air Ministry Order states that the maximum amount of accumulated leave which may be taken by officers after return to home establishment will be further reduced to 60 days in regard to officers arriving home on or after Oct. 1, 1931. This reduction will not apply to short-notice or medium-service officers returning home at the conclusion of their active list service to whom the maximum of 91 days will apply.

A further order will be issued regarding the leave of officers posted to home establishment from India.

Aircraft in Coast Defence.

The Essay which won the Gold Medal of the Royal United Service Institution for 1929 appears in the current issue of the Institution's Journal.

The subject was "The Role of Aircraft in Coast Defence" and the winner, Wing Commander C. J. Mackay, M.C., D.F.C., was also awarded the first Trench-Gascoigne Prize. Wing Cdr. Mackay, then a Flight Lieutenant, won the Gold medal in 1921, when the subject was "The Influence of the Future of Aircraft on the Problem of Imperial Defence."

With the exception of a number of excisions necessitated by Official requirements and considerations of space, Wing Cdr. Mackay's Essay is published in full and it should be read carefully by all those who propose to make the Royal Air Force their career. The Author is moderate in his claims for the Air Arm and has treated the subject from the broadest possible point of view. He discusses Coast Defence in its relation to Imperial Defence and not merely as a question of the invasion of these shores, and says that it is upon the Fleet and not upon coast fortification that the security of the British Empire rests.

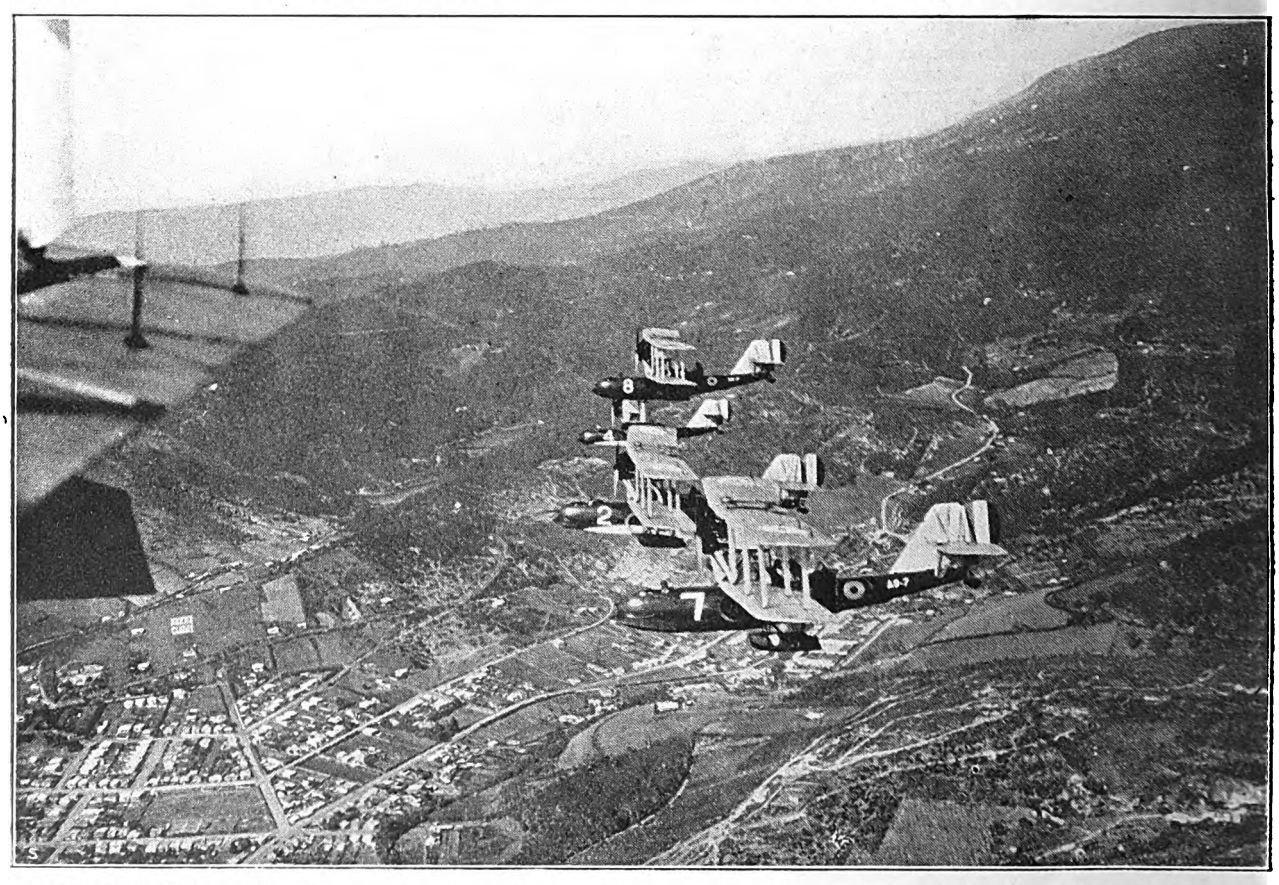
Examining the history of the gun he arrives at the following conclusions:—

History supports the view that the big coast-defence gun is an effective deterrent against most forms of attack. Against air attack, however, it is powerless. It requires air observation to be effective against ships, and, in that it is immobile, it is liable to lock up large sums of money in a distant part of the world which may never be the scene of a war in which the British Empire is involved. Whatever the conditions of the past, the state of our finances to-day forbids the erection, in numerous parts of the world, of steel and concrete monuments of our determination to deter.

Dealing with the anti-aircraft gun he says that it lacks deterrent power, for it is an axiom of air power that anti-aircraft fire alone will not prevent a determined attack from reaching its objective.

In the case for the aeroplane in coast defence he says that its role is not necessarily universal. What might apply to Singapore would not necessarily apply to Malta. He does not attempt to prove that the aeroplane is a substitute for the small armament of all bases. But he claims that the ideal deterrent is the big gun and the aeroplane and that but for the urgency of economy it would be unnecessary to suggest the substitution of the one for the other.

The result of the inaccuracy of the bomb during the War had been a tendency in Fleet aviation after the War to abandon the bomb in favour of the torpedo. The percentage of hits obtained in air torpedo attacks since 1921 suggested that the aircraft torpedo could be discharged with considerable accuracy and that if, as was the accepted figure, six



IMPERIAL DEFENCE.—Supermarine Seagull Flying-boats (Napier Lion engines) **of the Royal Australian Air Force flying over Hobart,** Tasmania.

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FLY AS YOU DRIVE

SIDE-BY-SIDE

"Well, goodbye Peggy. Cheeroh, Jim. Shall I swing your prop?"

"Don't worry old boy. Peggy does that."

"Oh come! You don't mean to say you let—"

"Well, she presses the self-starter. Same thing."

"Self-starter? Self-starter? What marvellous machine is this? Side-by-side seating, all metal construction, luggage in the boot, self-starter! Is this a 'plane, or a motor car?"

"It's a 'plane, with some of the better points of a motor car!"

"I must talk about this machine of yours. Blackburn Bluebird you say. What's she like to fly?"

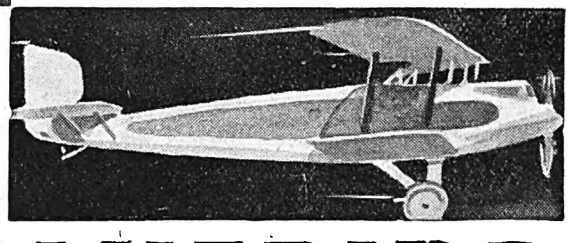
"Lovely. Simply that. Light, fast, reliable to a degree."

"Um, Blackburn Bluebird, eh?"

"That's it. And now we'll be off. You run away and start talking!"

"Well, it's certainly something to talk about."

This machine is the outcome of 21 years' manufacturing experience .... Price £795



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hits would put a battleship out of action, there was every reason to suppose the torpedo-bomber to be a deterrent in coast defence. The real objection to the torpedo as a weapon of air attack at sea was that, in order to deliver the projectile against the target, the aeroplane was compelled to descend almost to the level of the sea thus sacrificing its three-dimensional mobility.

The Author considers that the true weapon of the aeroplane in coast defence is the bomb. In using it the aeroplane retains its three-dimensional advantage and presents a difficult target to the anti-aircraft guns of the ships firing from unstable platforms. In destructive power the bomb enjoys distinct advantages over the torpedo. The question of accuracy had been re-opened on a scientific basis since the War, and during the recent *Centurion* trials the percentage of hits obtained by the two bombing squadrons had exceeded that obtained either by ship or shore guns against the same target.

Regarding weather conditions the Author points out that the only weather which would prevent the operation of land-based aircraft was fog, and fog would also prevent bombardment by hostile ships. In the case of night bombardment the aeroplane was a deterrent against attack and the big gun was not. The reader is reminded that deterrent power is not confined to the infliction of damage but also implies instant readiness for action.

The economic contention that to defend a base aircraft need not be permanently stationed in its vicinity is impracticable because, the Author states:—

> Statesmen have a marked aversion to any obvious movement of forces, even for purely defensive purposes, at a time when relations are strained, and which might compromise their efforts towards peace. There is, therefore, the danger, if aircraft are not kept permanently at the most vital places, that when required they will not be there in time.

After discussing the various problems relating to the defence of the Dominions, the indiscriminate bombardment of coasts and raids on fortified naval bases from the land side, the Author adds in conclusion:—

> The truth is that neither the Pact of Paris nor the League of Nations can prevent war, but they do serve the fine purpose of making war more difficult. Unfortunately, they make more difficult also the task of those on whom responsibility for the defence of this Empire rests. This difficulty is apparent in the increasingly vigorous reduction to which defence votes are subjected. In times such as the present, therefore, it is essential that the activities of all three Services be correlated to derive the maximum advantage from the limited funds available.

Finally he says:—

> The rôle of the aeroplane in coast defence, therefore, is to provide reliable but economical assistance to the Royal Navy and sea power, upon which, in the issue, the future of the Empire rests.

The R.A.F. in India.

The Times Special Correspondent in Peshawar, in a message dated May 29, states:—

> The Royal Air Force carried out another bombing raid on the hidden caves and barren nullahs where Badshah Gul, the Haji's son, with his followers, is still in hiding. The sound of distant bombardment may be heard in the Peshawar bazaars, where old men with long memories shake their heads, deploring the folly of the move of linking the tribesmen with Hindu agitators from the South.

Aircraft Carrier Movements.

H.M.S. *Argus*, one of the aircraft carriers of the Atlantic Fleet, has been reduced to Reserve and is undergoing repairs at Devonport. H.M.S. *Courageous* is also at Devonport undergoing a re-tubing refit which will not be finished until September when the re-tubing of H.M.S. *Furious* will be taken in hand.

H.M.S. *Furious* is now at Portsmouth and leaves for Torbay on June 10. She will then go to Devonport on June 16 and return to Portsmouth on the following day.

H.M.S. *Glorious* the newest aircraft carrier has been working with the Atlantic Fleet but leaves Devonport on June 12 for Malta. On Aug. 9 she will join the Mediterranean Fleet at Argostoli.

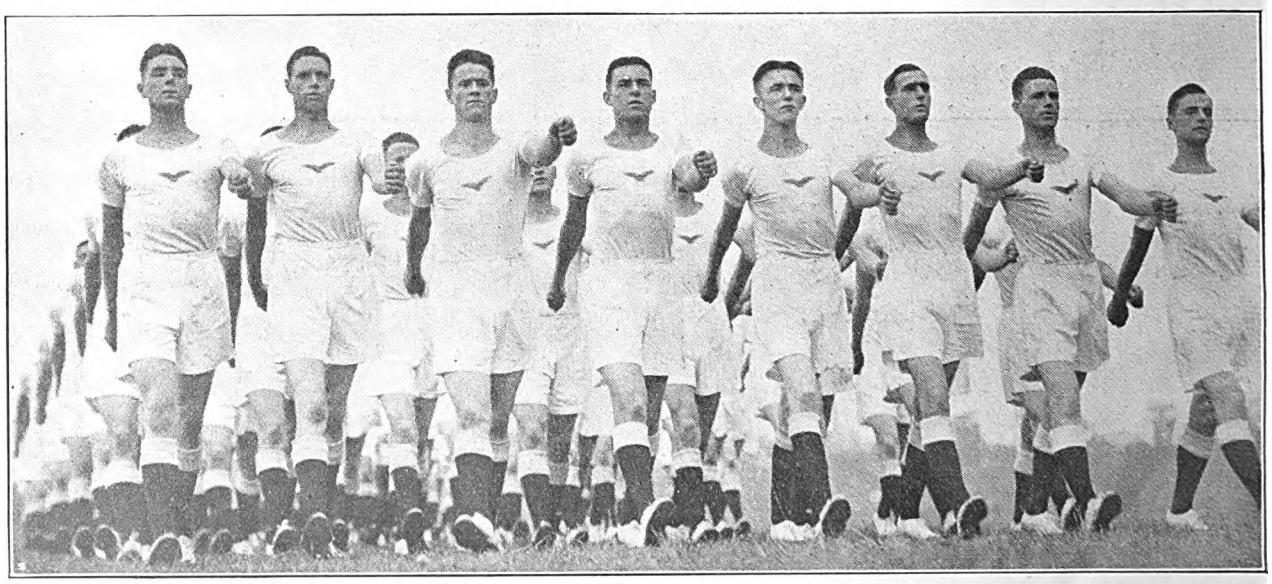
The Royal Tournament.

If only for the help that it gives to the Royal Air Force Memorial Fund, the Royal Tournament ought to be supported by everybody who has ever served in the R.A.F. The R.A.F. share of the profits of the Tournament last year was £2,300. In addition to its work for Service charities the Royal Tournament is, with the exception perhaps of the R.A.F. Display, the best show in London. And to a good many people the Royal Tournament is a better entertainment than anything aeroplanes can do.

During the lunch before the Dress Rehearsal, which is the Tournament Committee's graceful tribute to the help given them by the Press, Major-General Corkran announced with regret that the R.A.F. part of the programme could not be given before June 2 because of a bad outbreak of measles at Uxbridge. An officer of The Royal Fusiliers turned to the writer and said in tones of mock despair "I suppose you will go home now" to which one could only reply "Shan't," for after all only the very very young can call the R.A.F. their first love, and aeroplanes are soulless things compared with horses which waltz and fox-trot to the music of the band and gallop faultlessly through intricate movements with the guns despite the fact that their riders average only two years' service and have not a medal among them.

The speeches at the lunch were brief and to the point. Major-General Corkran, thanking the Press for what they had done in the past, said that, as in the last few years they had turned hundreds of people away from the Tournament because there was not enough room, he did not propose to ask the Press to do more than they had already done and he could only ask them not to do less. Speaking of those who thought that the Tournament was a militaristic show he could only say that he had seen a good many military tournaments during the past forty years and he did not think that he had ever seen anything in any of them with a shadow of resemblance to War as he knew it. [Then obviously the Tournament has been obtaining money under false pretences, for every boy and girl has gone to see it *because* it has professed to resemble war.—C. G. G.]

Mr. Tom Shaw, the Secretary of State for War said that the Tournament was fifty years old and hoped that General Corkran would be there in charge of it fifty years hence. He was a pacifist and belonged to a pacifist Government but he had never met a pugnacious soldier or sailor and he had never met a politician who was not pugnacious. There was nothing finer in the world than the sight of well-trained young men going through exercises of a really skilful character. He had nothing to say about the Army because its thousand years of courage and courtesy spoke for itself.



IN QUARANTINE.—Recruits of the Royal Air Force Depot rehearsing their Display for the Royal Tournament at Olympia from May 29 to June 14. An outbreak of measles prevented them from appearing until the second week.

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THE FACTS BEHIND THE GIPSY MOTH

1 Its designer, Captain Geoffrey de Havilland, O.B.E., A.F.C., F.R.Ae.S., has been flying his own aircraft of various types for 22 years.

2 Its designer has produced more successful types of aircraft than any other living designer.

3 It is constructed in the largest light aeroplane factory in the world.

4 It is the product of 5 years experience in marketing and perfecting one type.

5 It is produced in a modern factory built and equipped entirely since 1920 at a cost of over £200,000.

6 Its manufacture is supervised by 40 officially approved inspectors and 8 resident technical Government officials.

7 It is estimated that the manufacture and trading alone of the Moth give employment to more than 5,000 persons spread over nearly every civilised country in the world.

8 It is powered by the world famous Gipsy engine of which Captain C. D. Barnard recently said in the "Star" ". . . The Moth is wonderfully reliable and the Gipsy engine the best light aeroplane engine in the world . . ."

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The Tournament itself was quite up to its usual standard and perhaps even better as it is every year. All the old favourites are there, the trick riders of the 17th/21st Lancers whose hilarious and slightly gruesome performance does not disguise the brilliance of their horsemanship; the inter-Port Field Gun display in which the Navy hurls guns about as though they were made of cardboard; the mounted display by the Equitation School where cavalrymen are taught to undress themselves and their horses while jumping five-foot fences, for what war-like purpose one has never been able to discover; and the Cat-Burglary display by the P. and R. T. School, Portsmouth.

One heard on unreliable authority that the following conversation took place in connection with this last event:—*Soldier*: "Where do you get the men from for this stunt, are they trained at a special P.T. School like the Army?" *Sailor*: "No, they are all sorts, stokers, cooks, officers' stewards and so on. That one in the front is my servant, he is the worst servant I have ever had. I hope he breaks his neck."

The Musical Drive of the Guns was by "J" Battery and was as magnificent as ever and the Musical Ride by the 3rd. Carabiniers included several new dance movements, but was no less beautiful for that.

A new item was a piping display by the Scots Guards, an exhilarating entertainment for those who can stand it. The combined display by the Sappers, the Gunners, the Tanks and the P.B.I. showed various methods of crossing a river. When they had finished, a Naval fatigue party very kindly came in and rolled up the river for them.

The historical display by the 2nd. Batt. The Royal Fusiliers (City of London Regiment) is quite the best show of its kind that one has ever seen. They have wisely refrained from attempting to portray a battle and content themselves with showing Detachments illustrating the uniforms of the various periods of the Regiment's long and distinguished History. In the final phase the historical detachments march past halting at the gates of the Tower. They then turn inwards and present arms to the present-day detachments which pass through their ranks with bayonets fixed, colours flying and drums beating recalling the ancient privilege of the Regiment to march thus through the City of London.

Although the Recruits from the R.A.F. Depot, Uxbridge, were unable to take part during the first few days because of the large number in quarantine they are expected to be available from June 2 onward when undoubtedly they will give a very good account of themselves.—C. M. MCA.

Central Flying School Categories.

The following officers and airmen pilots who attended the Flying Instructors' Course at the Central Flying School from Feb. 4 to Apr. 21, 1930, have been categorised as follows:—

A1. Sq. Ldr, G. Jones, R.A.A.F.

A2. Plt. Off. E. C. Hudleston.

B. Flt. Lt. E. C. Barlow, Flt. Lt. S. R. Groom, Flt. Lt. H. L. Drake, Flg. Off. W. W. Brown, R.C.A.F., Flg. Off. H. Bailey, Flg. Off. J. S. Blomfield, Flg. Off. J. E. Allen, Flg. Off. D. Dickson, Flg. Off. J. E. Markby, Flg. Off. C. K. J. Coggle, Flg. Off. H. G. Hicks, Flg. Off. J. J. Owen, Flg. Off. A. E. Dark, Plt. Off. D. P. Lascelles, Plt. Off. R. W. Letchworth, Flg. Off. J. A. H. Louden, Flg. Off. J. H. T. Simpson, No. 335349 Sjt. Wright, G. H.

C. Flg. Off. K. F. T. Pickles, Flg. Off. N. E. White, No. 362145 Sjt. Shippobotham, H. P., No. 340242 Sjt. Marks, L. C.

The following officers and airmen pilots have been recategorised as follows from the dates stated against their names:—

A2 TO A1. Flt. Lt. G. S. White (12.5.30), Flt. Lt. N. H. N. Fletcher (14.5.30.), Flg. Off. R. J. Legg (15.5.30.), No. 121815 F-S. Williams, J. P., (15.5.30.), No. 334786 Sjt. McMillan, A. R., (19.3.30.), No. 6429 F-S. Crane, B., A.F.M. (11.4.30.).

B TO A2. Flt. Lt. A. Jerrard, V.C. (29.4.30.), Flt. Lt. J. MacG. Fairweather, D.F.C. (18.3.30.), Flt. Lt. W. E. Swann (29.4.30.), Flt. Lt. T. C. Luke, M.C. (2.5.30.), Flg. Off. J. F. Lawn (3.4.30.), Flg. Off. J. W. Duggan (3.4.30.), Flg. Off. A. V. Harvey (11.4.30.), Flg. Off. V. B. J. Jackson (15.5.30.), Flg. Off. H. C. D. Hayter (15.5.30.), Flg. Off. N. R. Buckle (12.5.30.), Plt. Off. E. Coleman (15.5.30.), No. 335717 Sjt. W. J. Barrett (15.5.30.), No. 128622 Sjt. Goodyear, J., (12.5.30.), No. 335127 Sjt. Kinnear, D. (15.5.30.), No. 110968 Sjt. Ginn, P.C. (15.5.30.).

C TO B. Flt. Lt. H. E. Power (12.5.30.).

The following officer is awarded the B category under para. 353, clause 10 (*g*), of K.R. and A.C.I.:—

Flt. Lt. R. T. B. Houghton, A.F.C.

The following officer is awarded the B category, as from Apr. 6, 1930.

Flg. Off. J. V. Yonge.

More Nonsense at Westminster.

In the House of Commons on May 28, Mr. West Russell asked the Under-Secretary of State for Air whether, with a view to popularising air transport, he would consider the organisation of an Air Week or Fortnight during which all available R.A.F. machines should visit the chief aerodromes of the country and give displays and passenger flights.

Mr. Montague said he could not agree with the suggestion. How far the R.A.F. could promote civil flying interests was carefully considered when the training programme of the year was prepared and arrangements were made for the attendance of Service aircraft at flying meetings and for visits of flying-boats to seaside towns. The assistance which was already being given was the utmost that was possible with due regard to Service requirements.

[Mr. Russell's idea might be extended. Why not have Tank Weeks as an impetus to ratting and Navy Weeks to energise the shrimping industry.—ED.]

Low Flying.

In the House of Commons on May 28 in reply to a question by Mr. Day, the Under-Secretary of State for Air said that action had been taken by his Department in a number of cases of dangerous flying during the past 12 months. Such action had taken the form where R.A.F. pilots had been concerned, of bringing the alleged offender to trial by court-martial in a really serious case. In other cases pilots had been dealt with summarily under the Air Force Act, or other appropriate disciplinary action had been taken against them.

Where civil pilots were concerned the institution of legal proceedings was a matter for the civil police and not for the Air Ministry. Each complaint had, however been investigated by the Air Ministry and taken up where the circumstances warranted it, with the owner or pilot of the aircraft concerned, with a view to the prevention of a similar cause for complaint in the future.

There had been eight cases in which pilots had been tried by court-martial.

The R.A.F. Dinner Club.

The 8th Annual Dinner of the R.A.F. Dinner Club will be held in the Connaught Rooms at 20.00 hours on June 27,—the eve of the R.A.F. Display.

Members wishing to attend the dinner are requested to notify the Hon. Secretary, Sq. Ldr. J. O. Andrews, D.S.O., M.C., Air Staff, Air Ministry, Kingsway, W.C.2, forwarding at the same time a cheque or postal order for Seven Shillings and Sixpence payable to the R.A.F. Dinner Club. All applications should be posted to reach the Honorary Secretary not later than the first post on June 20, but it is requested that applications be made as early as possible, in order to enable the number of Members dining to be estimated. *For applications received after June 20 the price of tickets will be raised to £1.* Dinner Tickets will be posted to members during the week beginning June 23.

All seats will be numbered and a numbered plan will be displayed in the ante-room. Members should apply in the ante-room for numbered tickets corresponding to the numbers of the places at which they or their party wish to sit. It will greatly assist the Committee if Members who are able definitely to arrange their parties before June 27 will send a list of names to the Honorary Secretary, who will reserve the necessary number of seats.

The Upavon Station Sports.

The Annual Sports of the R.A.F. Station, Upavon, were held on May 21 in good weather. The band of No. 1 F.T.S., Netheravon, played during the afternoon.

The Inter-Squadron Shield was won by No. 3 (Fighter) Squadron, who scored twenty-four points.

The results were as follows:—

High Jump (Team Event).—No. 3 (F) Sqdn. (1) (Flg. Off. Spendlove, AC. Thomas, S-M. Stubbs); No. 17 (F) Sqdn. (2); Station H.Q. (3).

440 Yards Team Relay.—No. 3 (F) Sqdn. Team (1) (Flg. Off. Gillmore, S-M. Stubbs, Sjt. Coote, AC.1. Harns); No. 17 (F) Sqdn. Team (2); Station H.Q. Team (3).

Tug-of-War.—No. 17 (F) Sqdn., Winners; No. 3 (F) Sqdn., Runners-up.

Two Miles Relay.—No. 17 (F) Sqdn. (1) (AC. Lang, AC. Bryan, Flg. Off. McPreson, AC. Lambshead); No. 3 (F) Sqdn. (2); Station H.Q. (3).

Long Jump.—No. 3 (F) Sqdn. (1) (Sjt. Coote, 19 ft. 7½ in., Flg. Off. Gillmore, L-AC. Hardy); No. 17 (F) Sqdn. (2); Station H.Q. (3).

One Mile Team Race.—No. 17 (F) Sqdn. (1) (AC. Lang, Flg. Off. McPherson, AC. Bryan, AC. Lambshead); No. 3 (F) Sqdn. (2); Station H.Q. (3).

Putting-the-Shot, Teams.—No. 3 (F) Sqdn. (1) (Flg. Off. Kerr, Cpl. Leman, AC. Haines); No. 17 (F) Sqdn. (2); Station H.Q. (3).

360 Yards Hurdles (Relay).—No. 3 (F) Sqdn. (1) (Flg. Off. Spendlove, Sjt. Coote, L-AC. Thomas); No. 17 (F) Sqdn. (2); Station H.Q. (3).

Officers' Race (100 Yards).—Wing Cdr. W. R. Read (1); Flt. Lt. Oliver (2); Flt. Lt. Chapman (3).

Serjeants' Race (100 Yards).—S-M.2. Stubbs (1); Sjt. Coote (2); F-S. Simpson (3).

Medley Race.—No. 3 (F) Sqdn. (1) (Flt. Lt. Oliver, Flg. Off. Kerr, S-M. Stubbs, L-AC. Thomas); No. 17 (F) Sqdn. (2); Station H.Q. (3).

Obstacle Race.—AC. Stimpson (1); Plt. Off. Lord Malcolm Douglas-Hamilton (2); AC. Sayers (3).

Mile Relay Race.—No. 3 (F) Sqdn. (1) (Plt. Off. Spendlove, Sjt. Coote, Flg. Off. Greenwood, AC. Haines); No. 17 (F) Sqdn. (2); Station H.Q. (3).

220 Yards Consolation.—AC. Griffiths (1); AC. Cockwell (2); Cpl. Knight (3).

The Prizes were distributed by Mrs. E. D. Johnson.

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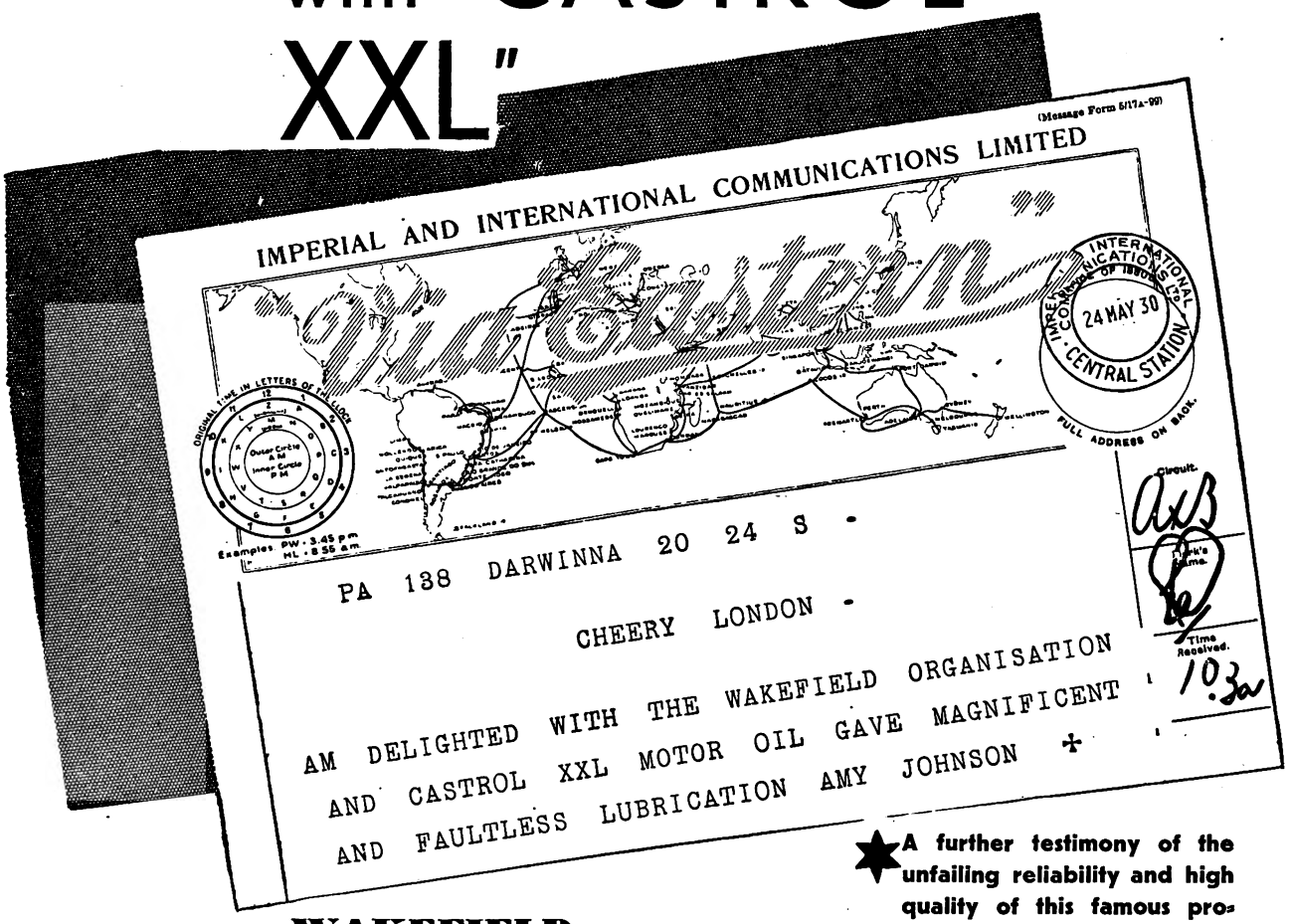
MISS AMY JOHNSON CABLES:

"I AM DELIGHTED with CASTROL XXL"



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THE WILBUR WRIGHT MEMORIAL LECTURE.

The Eighteenth Wilbur Wright Memorial Lecture was given before The Royal Aeronautical Society by Mr. H. R. Ricardo, F.R.S., F.R.Ae.S., M.I.A.E., Assoc.M. Inst.C.E., on May 30 at 18, John Street, Adelphi. There was a large attendance to hear this, the most important lecture of the Society's year, and the big lecture room of the Royal Society of Arts nearly reached saturation point.

The President of the Society, Colonel The Master of Sempill, explained that this lecture had been founded to commemorate the achievement by Wilbur Wright of the first power-driven flight ever made by man. He read the cable which had been sent in the Society's name to the surviving Wright Brother, Mr. Orville Wright.

The cable said:—

Once again we are privileged to pay homage to the memory of your distinguished brother, and we also wish to express great pleasure in the knowledge that you are still playing a prominent part in the development of aeronautics.

The memorial lecture this year deals with aircraft engine development, a peculiarly appropriate subject, since the name of Wright will be handed down to posterity as that of the first person in the world to pilot a power-driven aeroplane.

We would welcome observations on the horse-power you found necessary to make the first flights.

He went on to say that the giving of this lecture was a much-sought-after privilege and he thought members would agree that the Council had done wisely in asking Mr. Ricardo to give it.

He referred to the coming of age of the Aeronautical Research Committee and said how glad the Society were to welcome that evening Sir Richard Glazebrook, who had had so much to do with the founding of the Committee. He also drew attention to the presence of Lt.-Col. Moore-Brabazon, the 21st anniversary of whose first flight on May 2, 1909, had only recently passed.

Colonel Sempill then drew an amusing picture of Mr. Ricardo at Rugby in 1900, when he built a steam-driven motor-cycle, which he fed with small pieces of coal, which he carried in specially constructed and capacious pockets in his coat. He went on to outline the lecturer's experiences and to remind the Society that Mr. Ricardo was made a Fellow of the Royal Society in 1928.

He said how glad the Society were to welcome this first appearance of Mr. Royce, who was awarded last year the Silver Medal of the Society for his brilliant work in connection with the winning engine of the Schneider Trophy. He referred to the two-cylinder motor-cars which Mr. Royce built somewhere about 1900, one of which is still running. He recounted how Mr. Clement, one of Mr. Royce's directors, used to drive to work in Manchester in one of these cars, but always had his hansom following behind to ensure his arrival.

Mr. Royce was presented with the Silver Medal, and briefly replied, saying he hoped that he would be privileged to do some more work of a similar kind.

THE LECTURE.

Mr. Ricardo opens his paper by explaining that the possibility of sustained flight was realised in the last century to be only waiting the development of a light enough prime-mover, and that, although the cleverly designed steam-plant which Sir Hiram Maxim used in 1894 weighed, including the boiler and condenser, considerably less per h.p. than the petrol engine used successfully by the Wright Brothers nine years later, yet with so hungry and thirsty a creature as the steam-engine, prolonged flight was quite out of the picture.

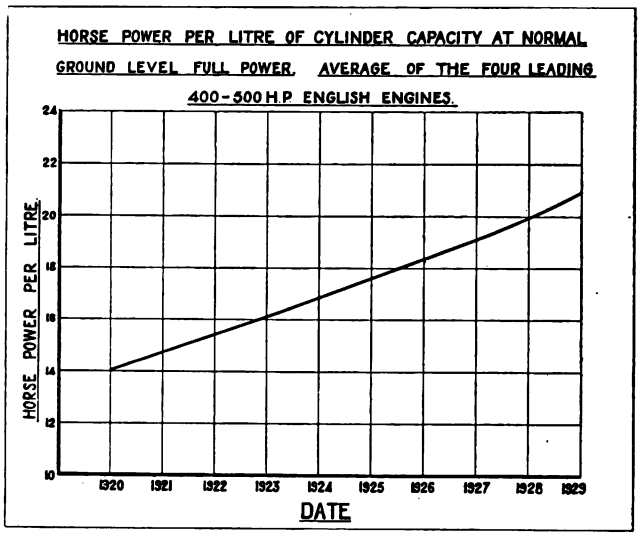
The engine which the Wright Brothers had to build for themselves weighed seven pounds per h.p. It had four cylinders of 4 3-8 in. bore and 4 in. stroke. They were made of cast steel and were water-jacketed with sheet aluminium. It had an aluminium crankcase and developed 30 h.p. at 1,300 r.p.m.

The rapid progress of the internal combustion engine in the last fifty years has been one of the most remarkable developments of mechanical engineering. From a minimum weight per h.p. of 500 lbs. fifty years ago the figure has dropped to 1½ lbs. per h.p. to-day and in the case of racing engines to well below one pound.

In those early days, after the success of the Wrights, only France grasped the immense future of aviation and devoted her best talent to the development of suitable engines. The most brilliant, the most original and the most daring development was the 50 h.p. Gnome engine, which was designed by M. Séguin. This remarkable engine was actually running as early as 1907 and weighed less than three pounds per h.p. The weight of the larger version which soon followed was only a little above two pounds per h.p., and this in turn was followed by the Gnome Monosoupape, an even more daring design by the same man.

THE CAST IRON MIND.

Comparing the large number of successful designs in



France in those days with the position in England, Mr. Ricardo says that development was hindered in this country by doubts about the commercial possibilities and the belief ingrained in all British engineers that, after oak, cast iron was the bulwark of Great Britain. Not until half way through the War 1914/18 were we finally able to break with the cast iron habit and to abandon a material which had served our forefathers so well for lamp-posts and kitchen ranges. [Which thing is an allegory.—ED.]

Mr. Ricardo mentioned that we entered the War with only one British engine with any considerable flying experience, and that was the much abused but still very serviceable R.A.F. At the start we were forced to rely on France for designs and experience, but before the end of hostilities the position was reversed. English-designed and English-built engines were in the ascendancy.

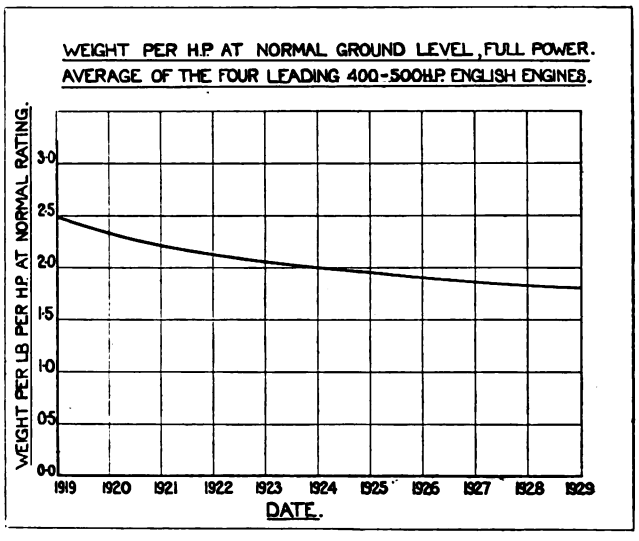
Progress since the War has been steady, and in this period the power-output of a given size of engine has been increased on the average by 40 per cent. This is partly due to improved thermodynamic knowledge, progress in metallurgy and the use of more suitable fuels, but mainly to meticulously careful design and the daily application of an ever-widening experience in service.

The power weight ratio has not however fallen to the same extent. Smoothness in running, a longer working life, and refinement generally have caused the same engine to put on flesh as the years roll by. Mr. Ricardo says that the modern aero-engine is not only about the most efficient prime-mover in existence but it is also one of the most reliable.

PROGRESS.

He then goes on to review the progress of the steam engine, and draws attention to the way in which fifty years ago the steam engine had crystallised into an almost standard design of open type, double-acting, slow-running engine. This was displaced after many years by the enclosed high-speed vertical type. This in turn was perfected until it seemed final, but was eventually superseded by the turbine.

Mr. Ricardo comments on the fact that this process of



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supersession is so prolonged because the newcomer in its raw and undeveloped state is expected to defeat the champion of the older school in the first round. Particularly does this apply to reliability, which is attained only by prolonged experience both in manufacture and service, neither of which are available to the newcomer. This attitude of mind is particularly prevalent in this country. It delays progress and allows obsolete types to survive their day.

The trend of aero-engine design since the end of the War has settled down to two main types of highly developed poppet-valve petrol engines: the air-cooled radial and the water-cooled Vee. Both have approached the limit of their capabilities. By analogy from the past, the time seems almost ripe for some innovation more radical than mere detail improvement.

By way of illustrating this point, Mr. Ricardo shows curves and quotes figures which show that there has been a considerable falling off in the rate of improvement of the power-weight ratio of the main types and that there is a similar lessening rate of improvement in fuel economy.

Although the magnificent performances of the Napier and Rolls-Royce engines in the last two Schneider Trophy Contests may be adduced as evidence against this opinion, Mr. Ricardo shows that such performances are made possible by the use of expedients, only allowable by the special conditions of the race. He says that, in fact, the remarkable vigour of racing engines is produced by stimulants rather than physique.

LINKS IN THE CHAIN.

Mr. Ricardo then analyses the progressive steps which have led to the 40 per cent. increase of power-output from aero-engines of the same cylinder-capacity in the last twelve years. There has been an all-round increase of nearly 20 per cent. in the mean effective pressure. This has been attained in part by detail improvements in the design and operation of valves, in part by the use of improvements in fuel, which made a higher compression-ratio possible, and in part by improved design of combustion chamber.

Speeds of rotation have increased all round by over 20 per cent. This has been achieved by improvements in materials, in mechanical design and in the technique of manufacture. Extensive experience and meticulous attention to detail have improved the life of the engine between overhauls by over 200 per cent. Each step has revealed the presence of some weak link in the mechanism and a halt has to be called till the link can be strengthened. Thus the process has continued, halting again and again to overhaul the chain until ultimately every link will be of equal strength and the limit of the type be attained.

FUEL FACTS.

The next stage of the lecture examines the manner in which the constitution of fuels affects the performance of engines. Mr. Ricardo says that the improvement of engine performance during the past ten years is due in no small measure to the improvement in the quality of fuel and especially its anti-detonating qualities. Less than twenty years ago practically nothing was known about the different hydrocarbon fuels. Petrol was just any volatile distillate of petroleum and was defined by its specific gravity.

Detonation, which now sets a limit to the compression ratio which can be used, was unknown as such and was regarded as a form of pre-ignition. Pre-ignition was regarded as an evil for which the engine-designer was responsible through having provided inadequate cooling. When benzole was introduced, a few years before the war, detonation disappeared and pre-ignition remained. The phenomena were thus separated and that one, at least, was affected by the fuel became apparent.

The lengthy investigation then instigated by the Shell Company into the cause of detonation and the individual behaviour of the various petroleum products was necessarily postponed until after the War. This research soon revealed that detonation was totally different from pre-ignition and depended primarily upon the chemical composition of the fuel.

Petrol, as such, is a mixture of hydro-carbons of three series: aromatics, naphthenes and paraffins, in proportions which vary according to the locality of the oil wells. The first of these are the least, and the last the most, prone to detonate. By suitable blending to increase the proportion of aromatics detonation can be reduced enormously. Thus much higher ratios of compression can be used with a corresponding gain in power-output and efficiency.

From ten to fifteen per cent. of the forty per cent. increase in power which has been gained in the last ten years is due to the higher compression ratios which have been made possible by the improvement in fuels caused by increased knowledge of the behaviour of their several constituents.

Because the value of petrol was formerly judged by its specific gravity alone, and because aromatics are heavy, fuels rich in these were considered as inferior petrols. So strong was this belief, that for several years the whole of the output of petrol from the vast oil-fields of Borneo was piped out into the forest and burnt.

More recently even minute doses of lead, thallium and other metals have been found to suppress detonation. This property is believed to be due to their avidity for oxygen, which induces them to rob the unstable peroxides which are present as intermediate products of combustion and whose instability is the primary cause of detonation.

To get over the difficulties of introducing metallic lead into the cylinder and removing the metallic oxide after combustion, a mixture of lead, tetra-ethyl and ethylene-dibromide is used. L.T.E. is soluble in petrol and has the necessary qualities of dissociation at the appropriate temperature. Ethylene-dibromide carries away to some extent the residual oxide.

There is some residual deposit left, and as this is liable to break down the insulation of the sparking plug the use of these anti-detonating dopes is limited to very small doses or to special occasions only. The addition of such is also more effective with good fuels than bad ones.

WATER VERSUS AIR.

The next section of the paper is devoted to a survey of the relative merits of water- and air-cooled engines, and Mr. Ricardo says that the controversy about their relative merits, which has raged since the earliest days, is not settled yet. In England and America there is a slight preference for the air-cooled engine, whereas the balance is the other way in France, Germany, and Italy. He suggests that, as the air-cooled engines predominate in countries where frost is of frequent occurrence, there is so little difference between the advantages of the two types that the least important is sufficient to turn the scale.

The advantages and disadvantages of the air-cooled engine are summarised as follows: (1) It is far less vulnerable; (2) it is lighter, although dry weight for dry weight air- and water-cooled engines are substantially the same,—to the dry weight of the latter, however, must be added the weight of water and radiator; (3) it is immune from plumbing troubles; (4) it is easier to overhaul; (5) it cannot be damaged by frost.

On the other hand: (1) There is, so far, only one successful type, and that is the radial, which, with increased power-output, further increases its already considerable frontal area, thus the increased head resistance offsets the advantages of reduced weight; (2) in any internal combustion engine the intensity of heat-flow is greatest at certain localised points. In the water-cooled engine heat can be transferred at an almost limitless rate from any local point. This is not possible in the air-cooled engine, which, to avoid local overheating, has to spend far more energy on cooling itself. Even so, it is forced to work at a lower efficiency and with more lavish lubrication.

While the more extensive use of high-conductivity aluminium cylinder-heads tends to widen the scope of air-cooled engines, the use of steam cooling and perhaps the use of liquids of higher and lower freezing points such as ethylene glycol will similarly affect the water-cooled engine. Mr. Ricardo says that steam cooling is particularly attractive because it is far less vulnerable than the present conventional systems and the condensers can be placed anywhere and in any convenient streamline form. The only real advantage that he can see in the use of ethylene glycol lies in its low freezing point, for little or nothing is to be gained from its higher boiling point as that of boiling water is quite as high in temperature as is wholesome. [This is not quite true of high altitudes.—ED.]

TALK ABOUT TYPES.

Mr. Ricardo then considers what scope is left for improvement of aero-engines of the present generally accepted types. The power output of any engine is a product of the weight of air it can consume in unit time and of the efficiency with which it can be utilised.

The efficiency in engines of the conventional type can only be increased by increasing the compression ratio, this is limited by the fuel and the fact that as the compression ratio is increased the gain in efficiency decreases whereas the increase in maximum pressure increases alarmingly. The point is near where the increase in maximum pressure makes so much extra weight necessary and involves so much more friction in moving parts as to neutralise the gain in power and economy.

The other alternative then is to increase the weight of air taken into the cylinder. This can be done by using oversize cylinders and working them at full capacity at high altitudes only: by increasing the speed and so filling the cylinder more frequently: or by supercharging and so overfilling the cylinder.

The use of oversize and underfilled cylinders has never proved successful in practice. Increase in speed involves

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AUSTRALIA SPEAKING!

A few days ago, Queensland Air Navigation Ltd., telephoned from Australia to our London Office. They reported that an Avro Ten monoplane had just completed 30,000 miles of air service, during and after which, the only replacement necessary in any part of the machine and its three Armstrong Siddeley Lynx engines, had been one new valve spring!

There seems to be no necessity at all for comment!

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The machine in question is the Avro Ten Commercial Monoplane for eight passengers and two pilots. It is the English version of the famous Fokker F7-3M, famous the world over for its magnificent air-route performances in all conditions. Information on request.

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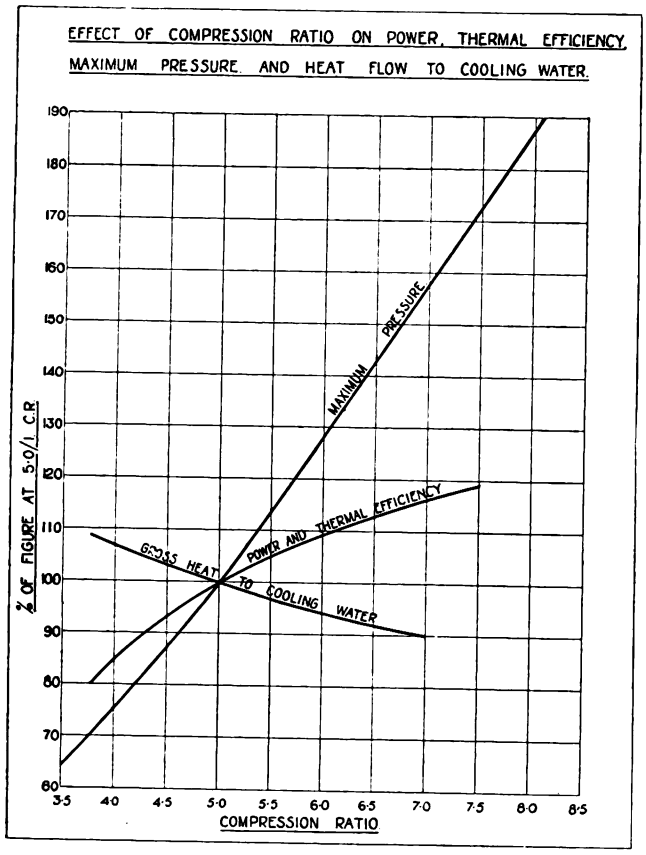


a large increase in the dynamic forces. This can be met by the use of smaller cylinders in greater numbers and the trend of development is certainly in this direction. This is limited by the necessity for duplicate ignition systems, with their increased weight and complexity. The same also applies to the carburation and distribution systems.

Supercharging.

Supercharging at present offers much the widest scope for increasing the power. The exhaust valve is the weakest link in the poppet-valve engine of to-day and the strain on this link in particular is accentuated enormously by supercharging.

Mr. Ricardo says that supercharging must probably be restricted to maintaining ground level power at altitude so long as the exhaust valve is with us. For apart from racing engines, where very special fuels can be used, not more than ten per cent. increase in power can be obtained with ordinary aviation fuel. The limit is set by the intrusion of detonation and pre-ignition due to over-heated exhaust valves and plug points.

Three general systems of supercharging have been tried. The exhaust-driven centrifugal blower which appears to be the most promising was developed actively just after the War. It proved very disappointing because of the low efficiency of the turbo-blower and the festoons of red-hot exhaust pipes which increase head resistance and fire risk.

The exhaust-driven fan has now been replaced by the gear-driven type with which ground level density can be maintained up to 12,000 feet. This type was used on the Rolls-Royce Schneider Trophy engine and with the special induction-pipe orifice maintained a very high pressure.

In America the positive-displacement type of blower has been used with considerable success experimentally. It runs at a relatively low speed, its efficiency at all times is slightly greater than that of the centrifugal type and it is capable of a higher pressure if and when required. The power absorbed by the blower when operating at low pressure or not in service is considerably less then required for the other types. The supercharger is very useful in assisting carburation and distribution in a multi-cylinder engine quite apart from its use in augmenting the power-output.

The Valve Question.

The exhaust valve has always been the weakest link in the chain throughout the history of the four-cycle internal combustion engine and if we are to look forward to any substantial increase in performance or the application of supercharging for purposes other than altitude compensation the exhaust valve must be abolished. The only practicable alternative in the light of present knowledge would appear to be a sleeve-valve. This mechanism has a further advantage that is controlled mechanically throughout its whole movement.

With a single sleeve its speed is almost uniform. This lack of appreciable acceleration forces means that as far as the valve mechanism is concerned the engine-speed may be almost unlimited. The absence of any hot surface in the combustion chamber allows of a much higher compression-ratio being used, or conversely permits the use of inferior fuels. Further, as the engine breathes through gills, rather than nostrils neither the shape nor the cooling of head need be encumbered with organs of respiration.

An experimental sleeve-valve engine has been run heavily supercharged for several hundred hours on ordinary aviation fuel at a brake mean pressure of over 375 lbs. per sq. in. and at a specific output nearly three times greater than that of any aero-engine now in service. This was achieved without the least sign of distress or overheating of the sleeve valve. The same engine on a fuel comparable to that used in the Schneider Trophy will maintain a brake mean pressure of over 550 lbs. per sq. in. when the specific output is nearly double that of the Winner of last year's Schneider Trophy.

Compound Engines.

The energy available in the exhaust with high degrees of supercharge brings into prominence the vexed question of compounding. The exhaust is discharged from the cylinder in the case above cited at a pressure of well over 300 lbs. per sq. in. and so is capable of doing nearly as much work again in a low-pressure cylinder as it has done already in the high. With a poppet-valve engine compounding is not worth the candle, but with a sleeve-valve engine compounding is comparatively easy because the same valve can be made to work as both inlet and exhaust valve to the high pressure and as inlet to the low pressure cylinders.

In a supercharged compound engine one would aim to do the bulk of the work in the two-cycle low-pressure cylinder and to use a pair of quite small high-pressure four-cycle cylinders both to take the bite off the pressure and temperature and to serve as valve gear for the low-pressure cylinder. This arrangement should not only improve the economy but also reduce the weight.

The sleeve-valve could probably be substituted in the water-cooled engine without much difficulty, but with the air-cooled engine the problem of cooling the hollow cylinder-head of a sleeve-valve engine is likely to prove difficult.

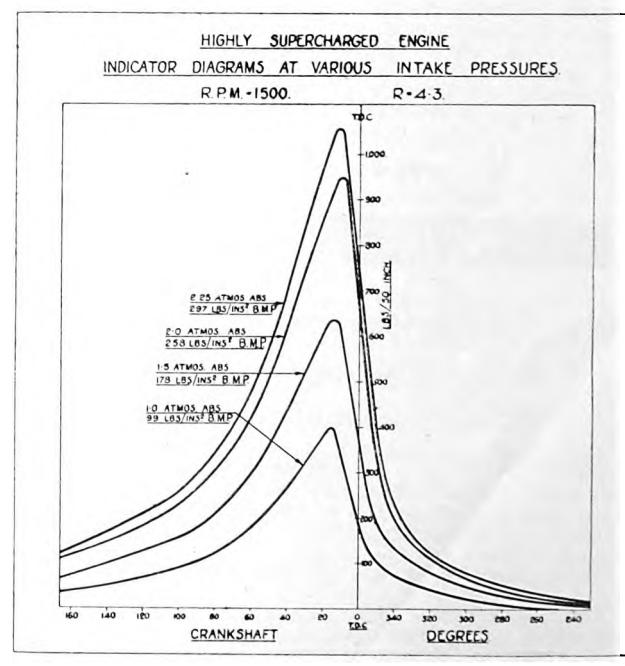
A single sleeve-valve engine was entered in the Army and Navy Competition in 1914 and put up a very good performance—it failed through breakage of its crankshaft. In every other respect it was warmly commended by the judges.

Compression Ignition.

The remainder of Mr. Ricardo's paper is devoted to the compression ignition engine and a consideration of the possibilities of adapting the fuel injection system of this type to the conventional petrol engine.

The arguments in favour of the compression engine are outlined under four heads. First, the elimination or enormous reduction in the fire risk; secondly, the improved fuel economy; thirdly, the elimination of electric ignition and the consequent removal of interference with radio; and lastly, a cheaper fuel can be used.

Mr. Ricardo says that the R.A.E. first showed the possi-



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bilities of making a fast-running heavy-oil engine which could be made more efficient than its clumsy prototypes. This was nine years ago, and now almost every aero-engine builder in the World is experimenting with the type, and finding it much less difficult than he had expected.

In this engine combustion appears to take place in three distinct phases. First, there is the delay period during which fuel is admitted to the cylinder but either fails to ignite or only burns from one or more minute nuclei. Next comes a rapid rise of pressure, during which the fuel which has already been injected burns very quickly at a rate which is determined by the degree of turbulence within the cylinder. This state of affairs continues until the pressure and temperature have reached so high a figure that the rest of the fuel can burn as it issues from the injector. The pressure rise is largely out of direct mechanical control in the first two phases, but in the last can be controlled entirely by the rate of injection. The smaller the cylinder or the higher the speed the longer the delay period, with the result that the maximum pressure is higher, as more fuel has to be burnt in phase two.

After explaining how the necessary high degree of turbulence within the cylinder makes a sleeve valve or two-stroke engine particularly attractive for compression ignition, Mr. Ricardo goes on to state that careful analysis of the various factors appears to show that given equal skill in design and manufacture, the heavy-oil engine (of the four-cycle type) will be some 50 per cent. heavier than a petrol engine of the same power output and of similar general design.

The compression ignition engine is admirably suited to work on the two-stroke cycle, and there seems no fundamental reason why this type should not be developed with a weight approaching very nearly to that of a contemporary petrol engine of the same output.

There is a difference in fuel economy of 0.2 lbs. per b.h.p. in favour of the heavy-oil engine, for although test-bed figures give a much smaller difference, yet the petrol engine in flight invariably does consume fully 20 per cent. of excess fuel, whereas the compression-ignition engine always maintains its maximum efficiency. If we take the weights of the fully equipped engines as 1.8 lbs. and 2.7 lbs. per b.h.p. the heavy-oil engine will begin to score when the range exceeds 4½ hours.

Referring to the very fine achievement of the Packard Company of America in producing a small radial air-cooled heavy-oil engine, Mr. Ricardo said that there was little doubt that a petrol engine of similar design and with the same margin of safety would weigh less than 1½ lbs. per h.p. The reduction gear usually fitted to an engine of such high speed had been omitted and the margin of safety appeared to have been considerably encroached upon.

After explaining the advantages which a system of direct injection would have over the present systems of carburation now in vogue for the petrol engine, Mr. Ricardo went on to say that a series of experiments started five years ago and on similar lines to those started by the late Major Norman thirteen years ago showed that both a higher power output and cooler running could be obtained when the fuel was injected during the suction stroke, because the whole of the latent heat of evaporation of the fuel was available within the cylinder both to cool the latter and to lower the temperature, thereby increasing the density of the entering air. Weaker mixtures also could be used with complete immunity from back-firing.

Experiment showed that even further fuel economy could be achieved with a sleeve-valve engine. By finely pulverising the fuel under higher injection pressure, safety fuels, such as kerosene of narrow distillation range, with high flash points could be used. Fuel consumption as low as .41 lbs. per b.h.p. and brake mean pressure as high as 150 lbs. per sq. in. could be obtained in a relatively low-compression petrol engine without any increase in weight at all.

Quite recently Hesselman has produced a low-pressure spark-ignition engine in which the fuel is injected under high pressure towards the end of the compression stroke and immediately before ignition. Still heavier fuels can be used by such means, but because the fuel is injected after the closing of the inlet valve the latent heat of evaporation is no longer available for increasing the air charge, and the power output is therefore considerably reduced.

Mr. Ricardo then concluded by explaining that he had not attempted to do more than outline some of the directions in which a departure from orthodox practice might usefully be considered and thanked both the various aero-engine builders and the Research Department of the Air Ministry for the help they had given him in the way of data, slides and so on.

A Vote of Thanks.

Mr. H. E. Wimperis, the Director of Scientific Research, made a characteristically graceful speech in moving the vote of thanks and one phrase was particularly memorable. He referred to Mr. Ricardo as one of those alchemists whom the Government was happy to employ and in turning money into knowledge he know of none who was more efficient.

Mr. Loughnan Pendred, President of the Institution of Mechanical Engineers, seconded the vote. Mr. Pendred laid particular stress upon the essential unity of mechanical engineering, and suggested that perhaps nowadays there was too great a tendency for vertical specialisation. He suggested that a broader outlook was helpful, and by way of illustrating his point suggested that one might put all thoughts of metal on side and look for some form of glass or quartz as the material to make sufficiently refractory exhaust-valves.

After this the President and the Council of the Society held a dinner at the Athenæum where presentations were made to Sir Richard Glazebrook and Col. Moore-Brabazon.

The inscription on the Silver Box presented to Sir Richard Glazebrook reads thus:—

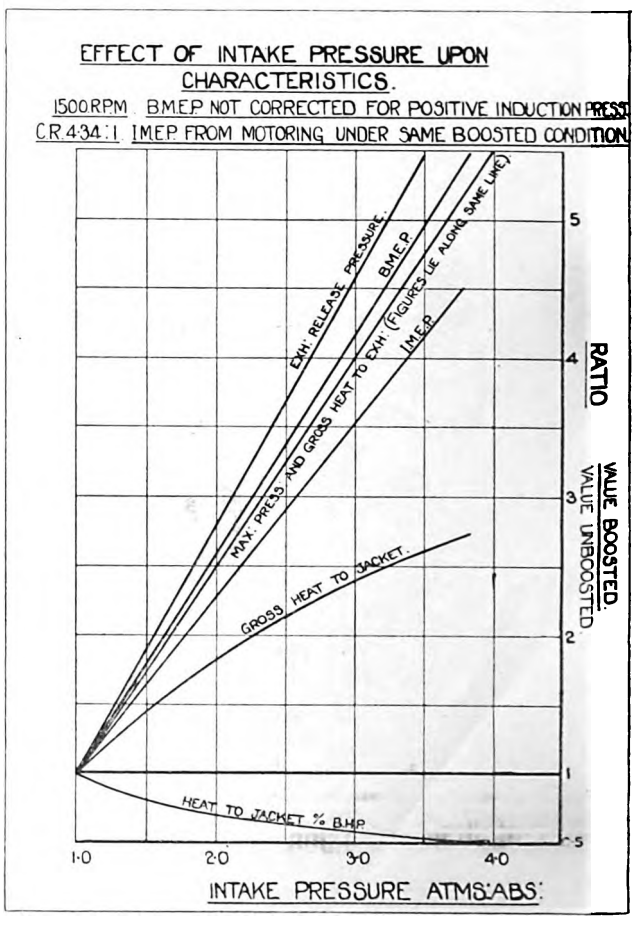
30th April:—Presented to Sir Richard Glazebrook, K.C.B., F.R.S., F.R.Ae.S., by the President and Council of The Royal Aeronautical Society to commemorate the Twenty-first Anniversary of the founding of the Advisory Committee for Aeronautics, 30th April, 1909.

The inscription on the Silver Aneroid presented to Col. Moore-Brabazon reads thus:—2nd May, 1930, Presented to Lieut.-Col. J. T. C. Moore-Brabazon, M.C., F.R.Ae.S., M.I.Ae.E., by The President and Fellow Members of Council of The Royal Aeronautical Society to commemorate the Twenty-first Anniversary of his flight on 2nd May, 1909—the first flight in a power-driven aeroplane piloted by a British subject in the British Isles.

[The beauty of the situation lies in the fact that this flight was made by an Irishman on a French aeroplane. England supplied the ground and the air.—Ed.]

The following list of those also present at the dinner appeared in *The Times*:—

Air Marshal Sir John Higgins (Air Member for Supply and Research), Sir Richard Glazebrook (Chairman of the Aeronautical Research Committee), Mr. F. Handley Page (Chairman of the Society of British Aircraft Constructors), Lieut.-Col. Mervyn O'Gorman (Vice-Chairman, Royal Aero Club), Dr. Gerald Merton (Chairman of the Air League), Mr. Loughnan Pendred (President of the Institution of Mechanical Engineers), Mr. E. H. Blake (President of the Society of Motor Manufacturers and Traders), Air Vice-Marshal Sir Sefton Brancker, Air Vice-Marshal Sir Vyell Vyvyan, Mr. H. E. Wimperis, Capt. P. D. Acland, Professor L. Bairstow, Major T. M. Barlow, Mr. M. L. Bramson, Mr. Griffith Brewer, Major J. S. Buchanan, Major G. P. Bulman, Wing Commander T. R. Cave-Browne-Cave, Mr. C. R. Fairey, Capt. F. T. Hill, Capt. A. G. Lamplugh, Mr. W. O. Manning, Mr. C. C. Walker, Mr. L. A. Wingfield, Major D. H. Kennedy, and Mr. J. E. Hodgson.



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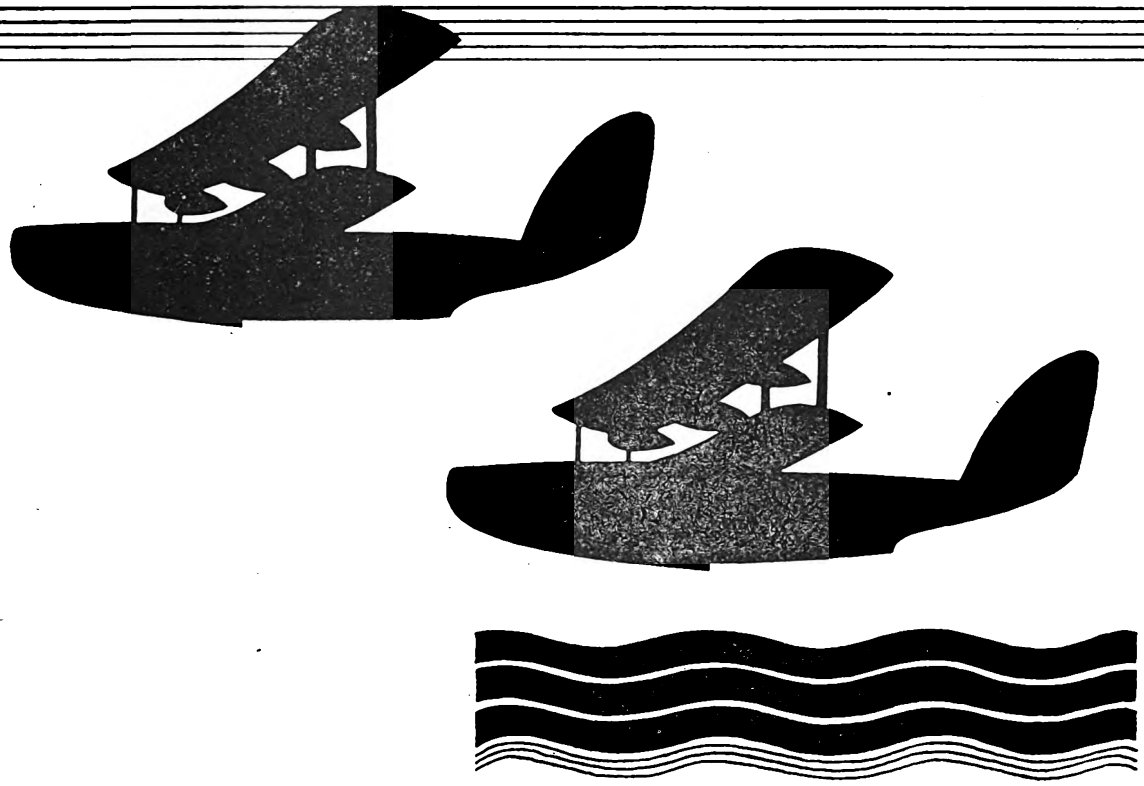

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DAILY NEWS, FEB. 27th, 1930

LONDON'S AIR DEFENCE.

PLANES THAT CLIMB LIKE ROCKETS.

By Our Air Correspondent.

I am able to state to-day that new high altitude "interception" fighting planes designed for the defence of London have finished official tests in a secret competition at the Royal Air Force Experimental Station, Martlesham Heath, near Ipswich.

The competition was opened by the Air Ministry to discover the best new single-seater fighters for the replacement of types now in the service. Leading British aircraft manufacturers entered a number of machines, some with water-cooled and some with air-cooled motors.

The competition has ended in a virtual draw between two remarkable fighting bi-planes each powered with a water-cooled super-charged Rolls-Royce engine of about 500h.p. They are styled respectively the Fairey Firefly and the Hawker Hornet. Both machines carrying full military loads can fly at considerably more than 200 miles an hour, the Firefly being slightly the faster. They climb like rockets, reaching an operational height of, say, 20,000 feet in a very few minutes.

The two successful craft will be sent round the Royal Air Force fighting squadrons for tests in actual service before the Air Council makes its decision as to which machine shall be ordered in quantity for the Royal Air Force "Interception" Squadron.

In the scheme of air defence these units, composed of fast climbing, high speed scouts, are scheduled to ascend to attack enemy air raiders immediately they are signalled across the English coast line.

EMPIRE NEWS, MAY 11th, 1930

FASTEST IN WORLD.

British R.A.F. Squadron's 'Planes.

As the result of the re-equipment of No. 33 Squadron R.A.F. stationed at Eastchurch with the latest type of Hawker Rolls-Royce bombing 'planes Britain now possesses the fastest bombing squadron in the world.

These new 'planes are two-seaters driven by 550 h.p. Rolls-Royce F type engines, and at a height of 10,000ft. can with a full armament of machine-guns and bombs fly at 190 miles an hour. At this speed they can outdistance any fighting aeroplane in use anywhere in the world.

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

THE LAST STAGE.

After flying to Alexandra Station from Port Darwin on May 26 Miss Amy Johnson went on to Longreach next day with stop at Conclurry for lunch. She appears to have beguiled the time en route with kangaroo chasing and detours to inspect whatever variation cropped up in the general monotony.

A vociferous welcome awaited the flying party at Longreach, and on Wednesday the trip to Roma was done with a stop at Charleville, 250 miles from Longreach and 160 from Roma.

From Charleville Miss Johnson set out in the morning on her last flight for some days, as it ended all but disastrously. Throughout the latter half her journey trouble had developed and got steadily worse, so as to cause misfiring at low engine speeds. She attributes it to the magnetos. On the last few stages the airscrew was in the habit of stopping as soon as the machine lost flying speed on coming in to land, and Miss Johnson says that she flew at full throttle nearly all the way across Australia. When she arrived over Brisbane, with an escort of three aeroplanes piloted by women, her engine gave out on the glide and forced a dead-stick landing. There was no time to make a full turn into the wind, and in landing slightly across wind Miss Johnson fouled a fence and nosed over. She was shaken but unhurt.

There, for the present ends an epic which will continue in an attenuated form when Miss Johnson flies to Sydney in one of the regular liners. The epic nature of the feat cannot long survive in the music-hall turn which it has inescapably become through so much frenzied Press exploitation. Miss Johnson's family are being made to perform in the short-lived pageant of fairy-tale munificence which generally precedes the obscurity of sensational pioneers. With a fine sense of the fitness of things, and a stinging realisation of the motives of venal publicity which had caused it to be bought by the Press, her engine downed tools and *Jason* buried his Press-agented nose in a millet field. It is a pity, and is in no wise the fault of the heroine of a fine effort; but she has at least consolations.

COMPLIMENTS.

His Majesty the King has been pleased to confer on Miss Amy Johnson the honour of Commander of the British Empire in the recently published Birthday Honours List.

The Council of the Society of Engineers has elected Miss Johnson an honorary fellow. The only other woman in the society is an associate member. The honour was in recognition of Miss Johnson's standing as the only woman holding a ground engineer's certificate in England.

The following cable was sent to Sydney on May 28:—

As master of the Guild of Air Pilots and Air Navigators of the British Empire I have the honour to welcome you to honorary membership of this Guild. Kindly reply acceptance.—SEFTON BRANCKER.

To which Miss Johnson cabled the reply:—

Gladly appreciate the honour conferred upon me which is one of my life's ambitions.—AMY.

Lord Thomson, Secretary of State for Air, received from M. Laurent Eynac, French Minister for Air, the following telegram:—

Please convey to Miss Johnson the expression of the profound admiration with which the whole of the French Air Service views the feat which she has just accomplished and to which I wish to add the heartiest personal greetings.

THE SEAGRAVE METEOR.

Further information concerning the Segrave Meteor I will be of interest to readers of this paper for few machines have created so much interest at their first appearance, partly because this is a type for which undoubtedly there will be a demand, and secondly because naturally people are interested to know the results when an acknowledged specialist in high-speed transport turns his attention to Aviation.

The photographs of the machine which appeared in THE AEROPLANE recently showed her complete in a general way, but without certain fairings underneath which must necessarily make quite a difference to her speed. The engines were shown without the final arrangement of cowling which practically covers the exhaust pipes; and the part of the fuselage where the undercarriage struts join was also shown without its fairings. The way in which this fairing is done is shown in the accompanying photographs, as is also the arrangement of the tail-unit.

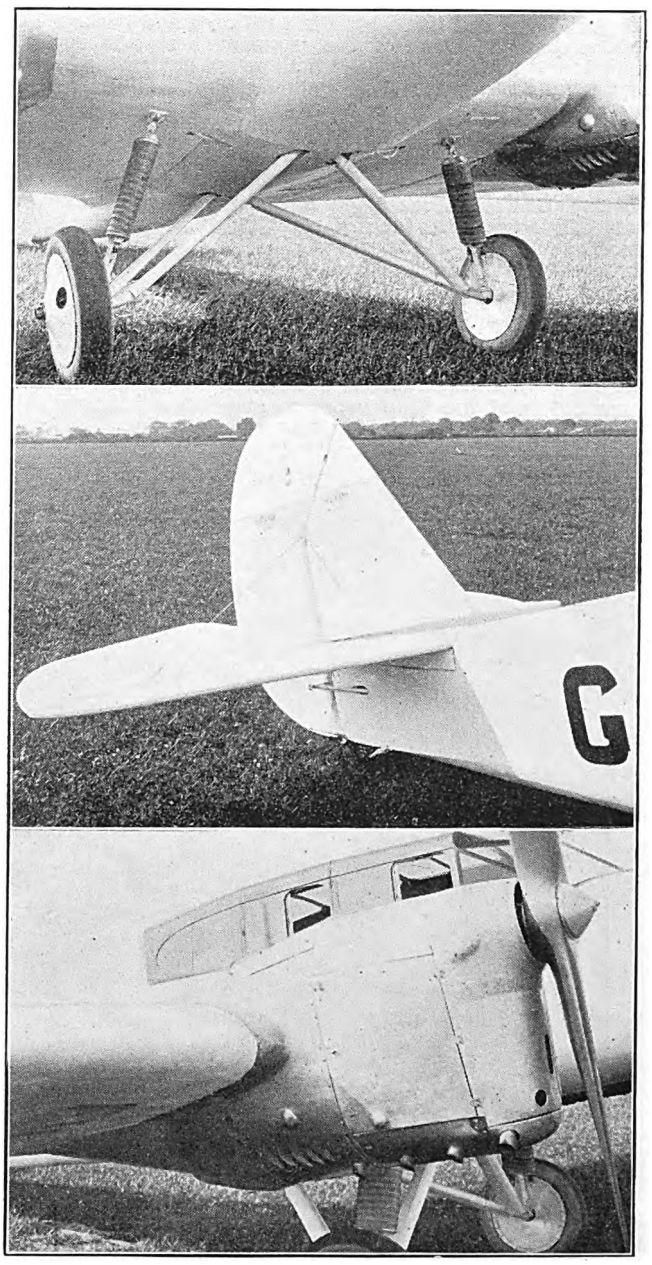
When flown, the performance of the machine was actually above estimated figures. The result was that the airscrews which were ordered for the estimated performance, proved to have too low a pitch, and consequently the engines could not be opened full out without over-revving them. And naturally, keeping the revolutions of the engine down reduced the performance. With airscrews of correct pitch the machine's speed ought to be far in advance of the estimated speed.

There is a good deal of interest in noting here the figures which Sir Henry Segrave calcuated on the design before the first machine was built. These are as follows:

Maximum speed	140 m.p.h.
Definite climb on either one of the two engines with complete controllability under full load.	at rate of 350 ft. per min.
Climb on both engines in excess of 1,000 ft. per min.	
Landing speed	between 50 and 54 m.p.h.

Cruising speed of 128 m.p.h. or thereabouts, according to taste.

The Martlesham test figures will be published when issued by the Air Ministry.



DETAILS OF THE SEGRAVE METEOR.—Top: The fairing of the undercarriage into the fuselage. Middle: The streamlining of the tail unit. Bottom: The cowling of the inverted Gipsies.

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THE WAY TO DO IT.

Mr. E. K. Rayson, a well-known British resident of Buenos Aires, recently flew home to London on his slotted Hermes Avian G-AAWF. Mr. Rayson left Buenos Aires on April 24 and flew the 900 odd miles to Santos with a passenger. From Santos he flew the 1,200 miles or so to Pernambuco alone, he reached the latter place on April 28.

On May 2 he embarked on the R.M.S.P. *Arlanza* at Pernambuco for Lisbon. On his arrival at the Portuguese capital Mr. Rayson again took off and flew some 850 miles to London, where he arrived on May 14.

This was really a very remarkable demonstration of the utility of the light aeroplane, both for saving time, and, one imagines, money. Presumably the crossing of the Atlantic for the machine and its owner plus the fuel costs, oil costs, landing dues and so on was less than the single fare home. Anyway flying home must have been much cheaper than shipping the machine all the way, and the pleasure of the journey must have been much increased.

EXPLAINING THE INEXPLICABLE.

The Aeroplane has already published the information that Miss Amy Johnson's D.H. Gipsy Moth was formerly owned by Mr. Lawrence Hope of Air Taxis Ltd. Last week the machine was in error coupled with another D.H. Gipsy-Moth on which Mr. Hubert Broad put up an official duration record of 24 hours.

That is the worst of these Moths. They make a habit of epic flights and only their registration letters distinguish one victor from another.

Anyhow G-AAAH was the D.H. Gipsy-Moth built specially for Mr. Hope and flown by him to Kenya and back. The whole space in front of the passenger's seat is one big petrol-tank with the fuselage built round it, leaving hardly any room for a passenger's legs. And there is another big tank behind the pilot.

WHAT MR. MURDOCH FLEW.

In a report of a recent speech by Capt. C. D. Barnard, reference was made to Mr. Pat Murdoch's flight from London to Cape Town. Both Capt. Barnard and The Aeroplane evidently forgot the type of machine on which Mr. Murdoch's remarkable flight was made. It was in fact an Avro Avian with a Cirrus engine.

AUGUST BANK HOLIDAY AT LYMPNE.

The Cinque Ports Flying Club have decided to hold a Flying Meeting at Lympne Aerodrome during August Bank Holiday Week-end—subject to final approval by the Air Ministry. An interesting and original programme is being arranged, and the Club hopes to make this meeting even more enjoyable than previous Lympne Meetings. Further particulars will be issued as soon as possible.

A NEW AGA KHAN PRIZE.

Through the Royal Aero Club the Aga Khan has offered another £500 to the first Indian who flies from any point in India to Cape Town within an elapsed time of four weeks from starting. The Royal Aero Club of India is drafting the rules under which the flight will be made.

Just why Cape Town should be chosen might well be explained. Indians are not popular in the Union of South Africa and there is a great deal of political feeling from time to time because the predominating Dutch influence in the Union wants, naturally, to keep Indians out, and the Indians, claiming to be British Subjects when doing so pays them, claim right of free entry to a British Dominion.

LIGHT AEROPLANE CLUB'S EQUIPMENT.

In the House of Commons on May 21, in reply to a question by Mr. Louis Smith, the Under-Secretary of State for Air said that a condition to the effect that aeroplanes used by members of subsidised light aeroplane clubs must be of British manufacture had not been considered necessary in the agreements hitherto made with the clubs in view of the obviously outstanding merits of British light aeroplanes and the extreme improbability of any of the clubs wishing to purchase from abroad. The question of including a stipulation of the sort in the new agreements would be considered.

THE CLOCK-WATCHER.

On May 31, Mr. J. E. Searle, a London member of the Cinque Ports Club, in the early stages of solo, took off in G-EBSA for half an hour. After about an hour various people were sent onto the aerodrome to wave flags at him, as the aircraft was needed for another pupil. Eventually Mr. Searle saw these activities and concluded that some part of the aircraft had fallen off. Pulling himself together he made a landing and inquired what the trouble was about as he had not finished his half hour. It was then discovered that the clock had stopped shortly after taking off, and he had been flying for an hour and a quarter.

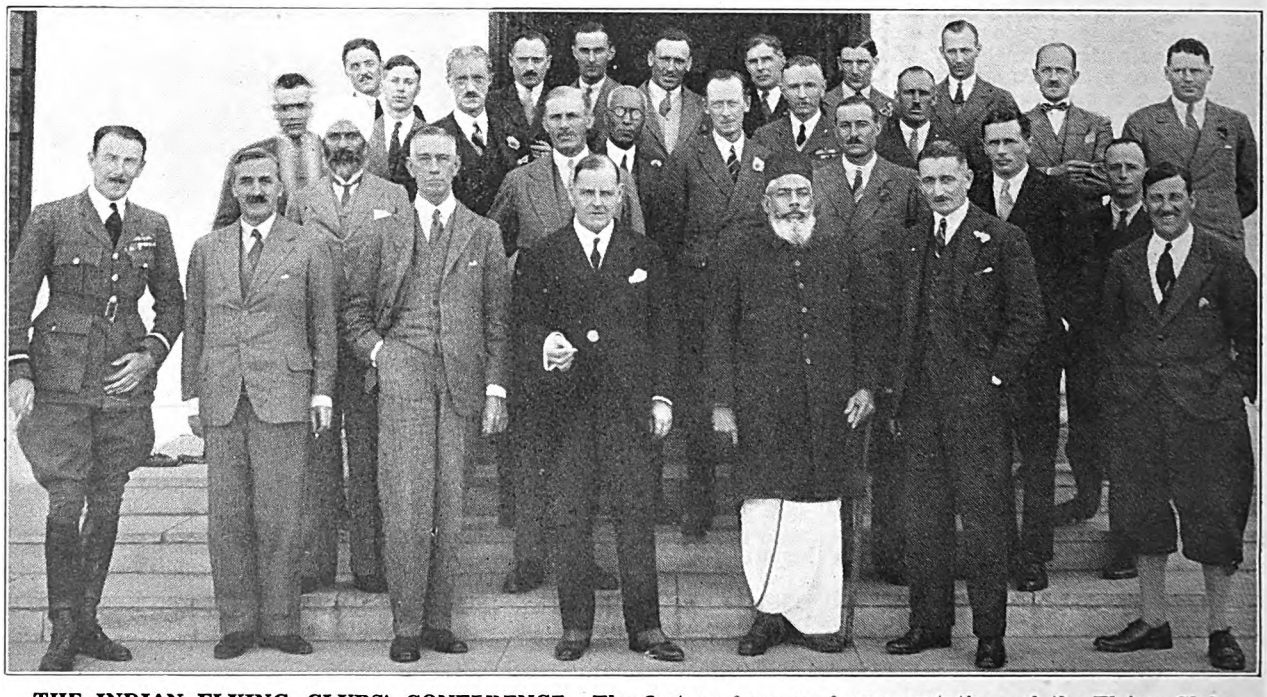
THE ASHWELL-COOKE CUP.

The Competition for the Ashwell-Cooke Cup, which should have been held on Sunday, June 1, was postponed on account of low cloud, and will be held at 15.30 hours on Sunday, June 15, being the first Sunday after Whitsun. The Cinque Ports Club hope that all private owners will make a note of this date, and that there will be a good field.

THE ANZANI ENGINE.

The firm of Henry Potez, of Méaulte (Somme), the well-known French aircraft constructors, has taken over the Anzani company and works.

This company will now enter the aero-engine market with a full range of engines suitable for light and medium-light aircraft.



THE INDIAN FLYING CLUBS' CONFERENCE.—The first conference of representatives of the Flying Clubs in India, held at New Delhi on Feb. 14, 1930. (Front row) Air Commodore Mills; Mr. Moore (Bengal); Sir Henry Moncrieff-Smith; Mr. Sams; Dr. Moonje; Air Marshal Sir Geoffrey Salmond; Flt. Lt. Jones (Karachi). (2nd row) Lt. Sodhbans (Lahore); Mr. Upton; Capt. Seymour Williams (Bombay); Mr. C. M. Grant-Govan (Delhi); Mr. Haselar (Bombay). (3rd row) Mr. Leete; Mr. Gallimore (Madras); Mr. Pinhorn; Mr. Pasricha; Lt.-Col. Shelmerdine; Group Capt. Verney; Mr. Warner (Bengal); Wing Cdr. Cooper (Sec., Aero Club); Mr. R. E. Grant-Govan (Delhi). (Back row) Maj. Vetch (Bombay); Mr. Rugginz (Karachi); Mr. Wilkinson (Bengal); Capt. Riley (Delhi); Wing Cdr. Crosbie; Mr. Bland (Delhi); Mr. Raynham (Bengal).

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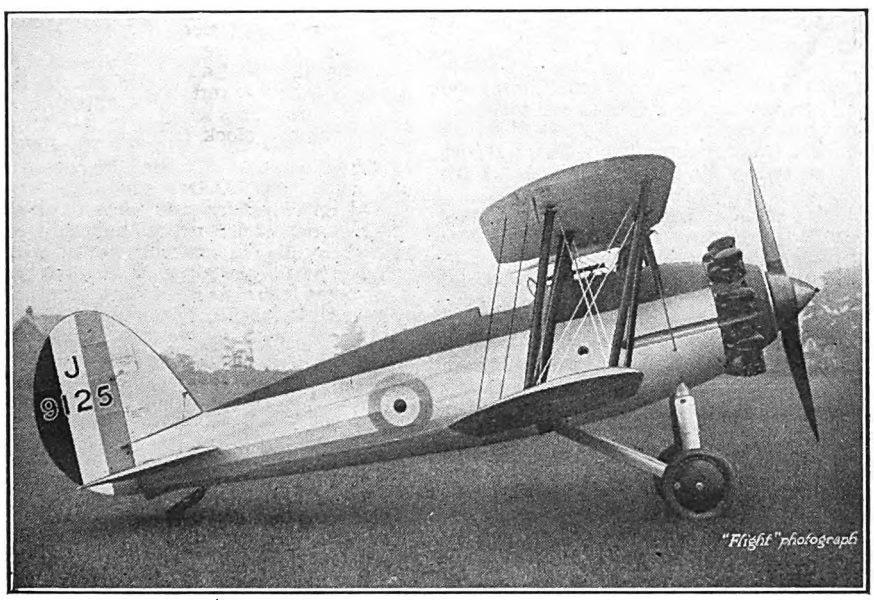

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For performance, fighting view and manœuvrability, it is impossible to find a machine to equal the Gloster All-Metal Single-Seater Fighter. Its construction has been described as an engineering triumph. Ease of maintenance in the field, and interchangeability of parts are other special features.

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MISS JOHNSON'S AEROPLANE.

In the House of Commons on May 29 Mr. Day asked the Financial Secretary to the Treasury whether the Government would consider the question of securing as a national possession the aeroplane in which Miss Amy Johnson made her flight to Australia.

Mr. Montague who had been asked to reply, said that he understood that Miss Johnson had already contracted to sell the aeroplane to a private person.

[What a silly question! Has anybody wanted to acquire as a National trophy Mr. Hinkler's Avian which went to Australia in several days' less time, or the Handley Page which first flew to India, or the Vickers Vimy which first flew to Australia? If we were to start on this sort of thing we should want all London as a junk-heap within a few years, unless our racial habit of pioneering became atrophied.—C. G. G.]

GET OFF THOSE—ROADS!

A view that ought to be far more usual than it is, in view of its obvious truth, is that expressed by Mr. P. Dujardin, who owns a Bluebird, in an interview to *The Yorkshire Evening Post* recently. "We live in an age," says Mr. Dujardin, "when one requires an antidote to telephones and motor-car hooters. I find that antidote in the clean invigorating air high above the smoky regions."

This owner-pilot, who is the manager of the Olympia Oil Mills at Selby, learned to fly with the Yorkshire Light Aeroplane Club and is intensely enthusiastic, for the sport has, he declares, restored his health to normal after having suffered for years from rheumatics and a general run-down condition caused by strained nerves.

Mr. Dujardin regards flying as a first-class tonic, and does a considerable amount of travelling for business and pleasure in the Bluebird which he bought through Auto-Auctions Limited. He made his first Channel-crossing without escort at Easter when he flew to spend his holiday at Maastricht, Holland, his birthplace.

"The people holding the reins of commerce and industry in this country are still prejudiced against flying," Mr. Dujardin declares, but he is confident that the rising generation will take their relaxation without having to queue up on crowded roads and ruin their nerves.

AN AERIAL TREASURE HUNT.

All the stimulating virtues of a pin-pointing competition added to the glorious uncertainty of a Derby sweepstake and a combined examination in history and geography are contained in the latest brain-wave from the Northamptonshire Aero Club.

The first Aerial Treasure Hunt will be a feature of the Club's annual meeting at Sywell on June 9 (Whit Monday), which contains other original items as well and is organised with the energy which has always added to the gaiety of nations at their previous meetings.

In order to give all entrants an equally unfair advantage THE AEROPLANE herewith publishes the first clue without explanations as to its acquisition. Among the entries for the Treasure Hunt to date are Lady Bailey, Flt. Lt. T. Rose, Mr. S. A. Thorn, Mr. Travers and Mr. Ruutz-Rees. The list is not yet closed.

Here followeth the clue:—

To get the first clue you must fly and find
A good main road that doth both twist and wind,
Some twenty miles from old Northampton town,
Unto a place, itself of great renown,
Whose name brings thoughts of sleep and dreams and pillows,
Added to that of river deeps and shallows.

The good John Bunyan lived for many a year
And wrote his great work while in prison here.

Now this high road do carefully survey
And you will find a village named Turvey;
Near it another village you will see—
If not sweet scented, well it ought to be.

Look slightly north of this place and you will see
A field between two woods ——— land by the T.

THE INTERNATIONAL TOURING COMPETITION.

Two additional British entries have been made for the International Touring Competition:—

Mono-Special (100 h.p. Warner) entered by Maxwell D. Trench, pilot Lord Carbery.

D.H. Gipsy-Moth (100 h.p. Gipsy) entered by Sq. Ldr. The Hon. F. E. Guest, P.C., D.S.O., pilot Miss Winifred Spooner.

The late entries bring up the total number of competitors to 101.

A FAMOUS CATERPILLAR.

On May 28 Major de Bernardi, who is famous as a Schneider Trophy pilot and the penultimate holder of the World's Speed Record, became a caterpillar. He collided in the air with another machine, the pilot of which was killed.

PEACEFUL PURSUITS.

The following appeared in *The Times* of Apr. 28:—

Three British subjects, Captain Holland, an airman, and two men named Cotton, father and son, were detained last week on suspicion of taking aerial photographs of prohibited areas of Rio de Janeiro during their flights. They were released on Friday, when searches of their residences and office disclosed photographs which showed nothing compromising. The police have since arrested another airman named Lloyd, but the charge against him is as yet unknown.

Capt. Sydney Holland has been doing air photography in Argentina and Brazil for the past ten years or so. His map of Buenos Aires, made entirely single-handed, is one of the most remarkable achievements in the history of photography. He has been working in Rio for some two or three years and is well known to all the official people. Mr. Cotton, Senr., who joined him last year, as business manager, is also known as a highly respectable citizen, so we can only assume that the whole thing was a mistake, or an example of one of those queer politico-commercial intrigues which do happen in foreign parts.

LICENCES FOR GROUND ENGINEERS.

The Air Ministry announces that examination boards will sit for the purpose of examining applicants for ground engineers' licences at the following times and places:—

(a) London, on the 1st and 3rd Wednesdays in every month.

(b) Croydon, on the 2nd and 4th Wednesdays in every month.

(c) Manchester, on the 1st Wednesday in July and October.

(d) Birmingham, on the 1st Wednesday in August and November.

(e) Bristol, on the 1st Wednesday in September.

Applications for licences should be made on the appropriate form, which is obtainable on request, and should be addressed to The Secretary, Air Ministry (D.C.A.), Gwydyr House, Whitehall, London. Applications for extensions to existing licences will also be dealt with at these boards, and such applications should be sent either by letter or on the usual application form to the address given above.

Applications for examination at the centres named at (c), (d) and (e), above, can only be accepted provided that the application is received 14 days before the dates specified and provided also that the total number of applications received are within the capacity of the board. Applicants whose applications are not accepted owing to these provisions, will be given the opportunity for early examination at London or Croydon, or alternatively, to be placed on a waiting list for the next board to be arranged in the particular place concerned.

"AGE CANNOT WITHER NOR CUSTOM STALE HER INFINITE VARIETY."—Mrs. Hartley, great-aunt of the brothers Robert, Norman, and Charles Blackburn, who at the age of 89 made her first flight with Mr. Norman Blackburn at Brough on May 29. She motored from Ben Rhydding and back in the day, besides flying. She was first married 70 years ago, and married again when 70 years of age.

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GLIDING.

THE BRITISH GLIDING ASSOCIATION.

The Committee of the Royal Aero Club have decided to give official recognition to the British Gliding Association. The control of the sport of gliding in Great Britain, including Competitions under the Competition Rules of the Royal Aero Club, will be delegated to them.

The Visit of Herr Kronfeld.

On May 28 Herr Kronfeld, the famous German sailflyer, landed in England and soon after his arrival was introduced to members of the Press in the Piccadilly Garage in Denman Street. Here, surrounded by a colossal din of cars entering and departing and sitting at a table in front of an extemporised buffet, Herr Kronfeld told of the possibilities of soaring flight. One imagines that he found the discussion which followed with various gliding enthusiasts was rather more to his taste than questions from newspaper reporters about whether flying in clouds was "thrilling." [One gathers that the proprietors of the Piccadilly Garage are running Herr Kronfeld for the British Gliding Association. One cannot imagine that such a reception can have impressed him with the dignity of British gliding.—ED.]

During the week Herr Kronfeld inspected a certain number of sites. On May 30 he went to Maidstone and gave a lecture to the Kent Gliding Club, who afterwards entertained him to dinner. On June 1 he visited Ivinghoe Beacon and helped the London Gliding Club with their instruction. Unfortunately there was not enough wind for soaring, so the Club were unable to persuade their distinguished visitor to give a demonstration.

Over the Whitsun Holiday, from June 7 to 9, if the weather and wind permit, Herr Kronfeld will give demonstrations of Soaring Flight at Itford Hill, near Lewes. He will also give primary instruction on a glider and lectures to the Instructors of Clubs which are affiliated to the British Gliding Association.

There will be accommodation in tents for members of the Association and Club instructors who will however have to provide their own meals.

At Itford Herr Kronfeld hopes to fly his own machine, the *Wien*, which he has brought with him. This sailplane is of the Professor type, but has an increased span and various refinements.

All the organising of Herr Kronfeld's flights will be in the hands of Woolfe and Lucas, Piccadilly Circus Garage Ltd. Members of the British Gliding Association will be admitted free to all these demonstrations.

The First Sailflight.

On May 28 *The Daily Express* announced that it had organised a series of great exhibitions of sailplaning—a sport developed from elementary gliding. These exhibitions are to be held during the Summer at many seaside resorts and other important centres.

This news, coupled with the fact that the British Gliding Association had made similar arrangements for demonstrations by Robert Kronfeld will gladden the heart of everybody who is at all interested in the sporting and scientific aspects of engineless flight.

Hard though all the Gliding Clubs have been working, there is no doubt that the sight of a Zogling tobogganing down the windy slopes of a hill, either air or ground-borne, is disappointing to the uninformed layman who has heard rumours of flights and climbs of incredible duration and altitude.

Now that the movement is being supported by one of the most powerful of the Press of to-day, popular opinion is likely to hear even more, and better still actually see sailplanes in flight. The clubs should prepare for a sudden influx of members.

By way of a dress rehearsal *The Daily Express* sailplane, which is a Kegel Professor, the agents for which are S. T. Lea Ltd., of Bond Street, was taken to Ivinghoe Beacon and temporarily housed in the tent of the London Gliding Club. Superhuman efforts on the part of members had the sailplane erected by Sunday morning (June 1), but unfortunately there was no wind and therefore no flights could be made by Herr Karli Maggersuppe, the special sailplane pilot of *The Express*.

On Monday however when all was quiet and still and everbody had gone back to earning their bread and butter, the wind got up sufficiently and the sailplane was launched. The longest flight lasted about eleven minutes. Perhaps there will be more wind at Itford. If so this figure will be considerably improved. Meantime, to read *The Express* one would think that nobody had ever soared before. Poor little Maneyrol's soaring flight of 3 hrs. 21 mins. in 1922 is forgotten, and *The Express* has invented soaring much as *The Mail* invented aviation.

The Needham Albatros.

Mr. C. H. Latimer Needham successfully flew his cantilever monoplane glider, the *Albatros*, from Ivinghoe Beacon on June 1. This machine has been designed by Mr. Needham as an advanced intermediate type and has a remarkably flat gliding angle. The R.F.D. Company, of Guildford, built the machine.

The Essex Gliding Club.

The Inaugural meeting of the Essex Gliding Club was held at the Royal Forest Hotel, Chingford, on May 26. The Club already has forty members and is anxious to enrol more. Apparently a condition of membership is that persons applying must reside in the County. The Honorary Secretary is Mr. W. S. Bannister, R.A.F.O., and his address is 20, Badlis Road, Walthamstow, Essex. One wonders where all these new clubs are going to find suitable terrain.

The Surrey Gliding Club.

The Surrey Gliding Club, of which Mr. R. F. Dagnall is Chairman, had their first meeting on May 25, when over 80 flights were made by members. Mr. C. H. Latimer Needham, who is the only R.Ae.C. Certificate B glider pilot in this country, gave some fine demonstration flights.

The Club own an R.F.D. type A.T. primary training glider which manfully stood up to the large number of flights made by members without gliding experience.

The Hon. Secretary is C. H. Taylor, 24, Woodbridge Hill Gardens, Guildford.

The Dorset Gliding Club.

The Dorset Gliding Club is well away and holds flying meetings three days a week at Upcerne, Cerne Abbas, Dorset, if the weather is suitable. The Club has members from Somerset, Wilts, and Hants.

The Westland Aircraft Company Ltd. is strongly represented in the membership of the Club by Mr. R. A. Bruce, the managing director, Captain G. T. R. Hill of Pterodactyl fame, and Mr. H. J. Penrose, who is a test-pilot to the firm. Mr. V. S. Gaunt whose papers before, and work for, the Yeovil Branch of the Royal Aeronautical Society are well known, is honorary ground engineer to the Club.

The Club evidently believes in gadgets as they have a wingless machine for training *ab-initio* pupils. This contraption is catapulted along the ground and has the controls coupled to a system of electric lights which tell the instructor whether the pupil is behaving properly.

A further gadget, *pace* Mr. Sinclair of Graham Amplions, who brought out the prototype for real aircraft, is a wireless set by which the pupil will hear the instructor's directions. Most pupils are on the ground long before the instructor's lurid injunctions have scorched the intervening 50 yards, for pupils are lucky if they are up five seconds, and so that the wireless set seems a bit redundant.

One can, however, see a use for it as the Club develops sailplane pilots. When the one and only sailplane has been up all day and the bar has been drunk quite dry, some ingenious wag will tune into the sailplaner and lure him back to earth with some wondrous tale of a stolen car or free beer. The free petrol business offers no attractions to the glider-pilot.

The annual subscription is one guinea. Entrance fee 10s. 6d. Non-flying facilities are granted to subscribers of half-a-guinea or more. The Honorary Secretary is Mr. H. Campbell Johnson, 4, Derby Street, Weymouth.

The Oxford and County Gliding Club.

One of the newest gliding clubs to be formed is the Oxford and County Gliding Club. The members of this Club so far have mostly been drawn from the personnel of the big Morris Motor Works at Cowley. Sir William Morris has become a patron of the Club.

A two-storey workshop in Cowley has been rented by the Club and here the members are hard at work building their first glider. They hope to have this machine flying in July. New members will be welcomed provided they are willing to pull their weight as workers. The Chairman of the new club is Mr. H. T. Beasley, and the offices of the Club are in Circus Street, Cowley.

Gliding at Nottingham.

On May 18, the Nottingham Gliding Club held a public meeting to raise money for the Club funds, which had been depleted by the crashing of their first machine. Mr. Marcus Manton was the attraction and made three flights in spite of the fact that the glider had been allowed to come on the field with a broken tail boom. The meeting eventually broke up when another strut was fractured by an enthusiast who was holding the machine back.

The local clergy are protesting against the Sabbath-breaking propensities of the Club, so one hopes the members will put up a sufficiently good show to warrant this publicity.

The Kent Gliding Club.

The Kent Gliding Club has, since inauguration, made steady progress. Mr. C. H. Lowe Wylde, who designed and with the help of Club members built the first Zogling type of glider to be flown in this country, has become honorary instructor to the Club. Many members have been instructed in the rudiments of gliding and have made successful flights.

The Honorary Secretary of the Kent Gliding Club is Mr. E. P. Parkes, 76, Week Street, Maidstone.

A Warning From Lancashire.

Some valuable experience has been gained by the Gliding Section of the Lancashire Aero Club which should be passed on to other Clubs. An attempt was made to launch the Club's glider off the level with two motor-cars in place of the usual launching team. The first attempt nearly ended in disaster.

The cars pursued divergent courses so as to give the pilot plenty of clearance. The pilot zoomed the machine up to a height of about fifty feet. The result was that the elastic never became slack and only came loose from the hook after giving a sharp tug downwards to the nose of the machine.

A second flight resulted in a fine effort of 240 yards on the level. But in a third attempt the cars accelerated too rapidly and the elastic parted at the point of attachment to one of the cars. Whipping back at high speed it smashed the front of the machine and bruised the pilot's shoulder. Neither injury was severe, but the following lessons were deduced from the experiment:—

1. The cars should follow a parallel course about thirty yards apart.
2. Their maximum acceleration should not exceed 6/8 m.p.h.
3. It is advisable to use a length of rope round the attachment hook and further lengths at the point of attachment to the cars with Sandow elastic in between.

[And 4. The use of cars is in fact so dangerous that it ought not to be allowed. Several people have been killed in the States in this way.—ED.]

A Cinque Ports Gliding Club?

The formation of a Gliding Club in the Folkestone District is proposed and the first public meeting will be held in about a fortnight. The proposed club has been formed to cover the towns of the Cinque Ports, if possible, but will be quite separate from the Cinque Ports Flying Club, who are, however, giving full support.

All those interested should write to L. H. Stewart, R.A.F. Station, Hawkinge, Kent.

Official Recognition.

The Royal Aero Club has awarded the following Gliding Certificates:—No. 1 to C. H. Lowe Wylde, certificate A; No. 2 to C. H. Latimer Needham, certificates A and B; and No. 3 to Marcus D. Manton, certificate A.

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COMMERCIAL AERONAUTICS.

TRADE FOLLOWS THE WIND-SOCK.

Now that Council houses, and especially electric power transmission lines, are spreading over the face of England after the manner of lukewarm treacle on a marble slab the question of landings is becoming of constantly greater moment to the traveller by air. Even lawful and natural arrivals are a distinct problem at any one of the hundreds of cities and towns which have no aerodromes, and the mercifully rare unintentional descents begin to assume a more and more dangerous aspect.

Motoring would still be an arduous sport of limited use if garages were only to be found in the larger cities and those rare spots where selfishness is really enlightened; and it is useless to deny that the sport and business of flying is denied most of its possibilities by having only the scrappiest kind of conveniences on the ground.

Forced landings can safely be left to the engineer and English pastures for the present. But the question of adequate service and convenience, with a passible landing ground, at every town which does any business with the outside World is becoming of urgent national importance.

Furthermore, when Municipal Councils reach the belated conclusion that aircraft must be allowed to come to their towns without trespassing or crashing or both, they should be saved from themselves in the choice of a site. Unfortunately the period when everybody, even including Councillors, knows something about practical flying, will necessarily come after the best time to lay out an aerodrome in the area of every community which hopes to retain or achieve commercial importance. Business brought or sent by air will follow ground facilities.

A HEART-BREAKING TASK.

The grief of the prospector for aerodromes is the daily routine for Sir Alan J. Cobham and his colleagues of Alan Cobham Aviation, Ltd. They operate as consulting aerodrome experts and have been retained by certain wide-awake communities to report on their neighbourhoods.

The ground work is purely laborious. At first sight the method of flying over the district and pin-pointing the likely spots seems the most logical, but, as Sir Alan pointed out to the writer recently, an aviator can only tell what ground is fit to land on at the moment—and that not always—but he is quite unable to see where a landing ground could best be developed for the use of immediate and remote posterity. The planning of aerodromes decidely calls for the long view,—and the horizontal rather than the vertical view.

So the choice is made by elimination. The country for four miles round the ambitious or far-sighted town is thoroughly prospected, and the possible sites vary in number according to the district and topography. If none appears within four miles the search is extended, but this is generally considered the limit.

The possible sites are reduced by elimination to a few of the best, then Sir Alan applies himself personally to visiting these and weighing their worth in terms of surface, approaches, altitude, usual weather, prevailing winds, distance from town, direction from town, cost of development and, lastly, possibility of acquisition.

The report which is sent to the client community is prefaced by numerous paragraphs setting forth the essentials of an aerodrome. This introduction includes elementary aerodynamics, meteorology and much that is mysterious to city fathers, the purpose being to forestall some of the questioning and argument which formerly wasted the time and money of both parties when the report was presented.

THE INEVITABLE.

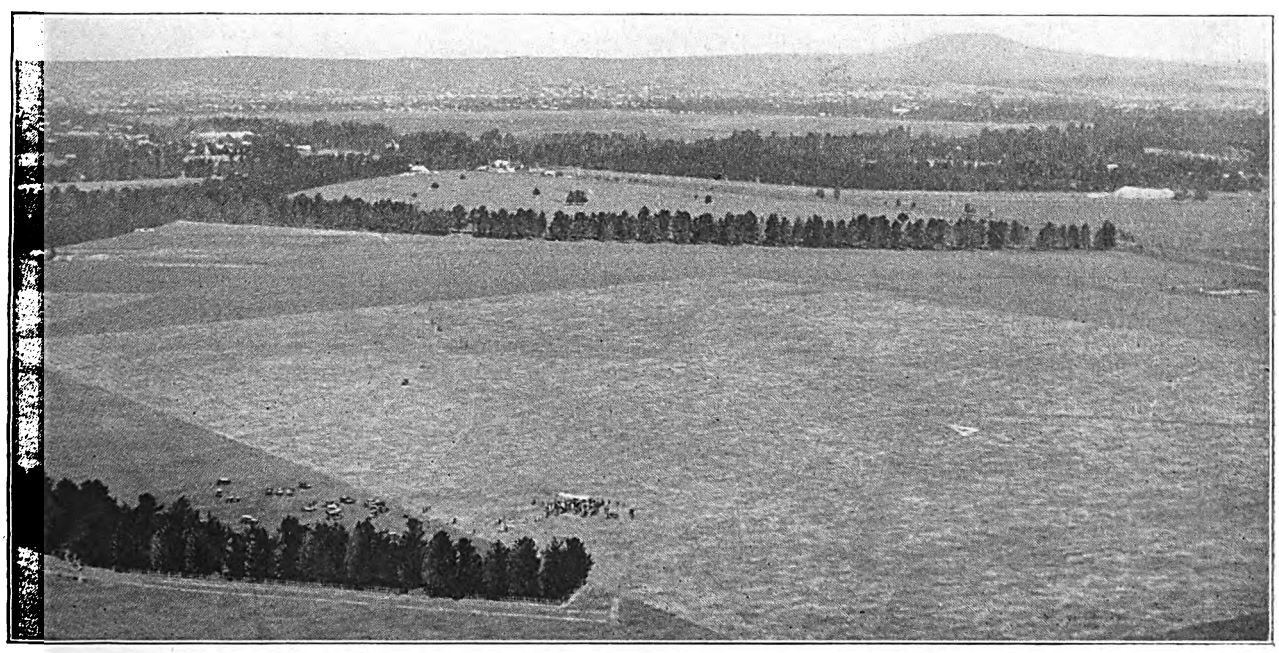
If the choice of the best ground were the only problem England might soon be adequately equipped with her hundreds of aerodromes which she will soon need at least as vitally as she does her thousands of railway stations and millions of petrol pumps. The removal of a few buildings, the occasional diversion of a stretch of road and the uprooting of numerous hedges probably constitute the simplest and cheapest engineering problem ever concerned with major transport termini. The arterial roads of recent date alone include enough land as, and represent far more money than, would be needed to equip every city in England with a first-class aerodrome and buildings.

But the greatest difficulty is usually met over the purchase of a site, and the fewer the sites the harder the bargain,—naturally. More than one case is on record of a municipality buying a site at four times the price for which it might have been bought three years ago when an aerodrome was a logical addition to the local transport system.

Once a site is known to have been recommended its value leaps. If there is only one possible site, as occasionally happens, it may become prohibitive. Generally, however, there is a choice of two, three or more, and provided the best one is not too widely published as such, and a little necessary commercial guile is used, it can be bought at a value which makes it a splendid investment, because preparation as an aerodrome improves it for almost any other purpose in the unlikely event of aviation failing to become a regular means of transport.

Often the adjacent land must be bought to prevent obstructions being built on it, for such obstructions diminish the landing ground by a distance from them equal to at least seven times their height. The objections of neighbouring householders are inevitable and natural—pending the time when aircraft are rather more silent—but the cruelties of change cannot be avoided, and to delay recognition of changing conditions in deference to its victims is commercial suicide. Nevertheless the vocal voter has his sway, and adds to the grey hairs of aerodrome prospectors.

Probably the simplest way would be to have suitable aero-



AN AUSTRALIAN AERODROME.—The £150 aerodrome at Ballarat.

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dromes prospected and selected by experts under the auspices of the State, and the selections kept severely secret. Propaganda and natural business pressure would eventually rouse the local authorities who would be presented on application with a choice of really good sites with all particulars of necessary development, and the infliction on business aviation of haphazard politically picked and practically impossible aerodromes would be avoided.

In the meatime Sir Alan Cobham and his staff are doing most valuable work for the country at large by selecting suitable sites, by saving communities from their own ignorance and by helping to forestall the operations of the speculative profiteer. May their work prosper.—F. D. B.

MUNICIPAL AERODROMES.

In the House of Commons on March 20 in reply to a question by Mr. Ede, the Under Secretary of State for Air said that he had received proposals for the establishment of aerodromes in the county of Durham. Certain sites had been inspected by the Air Ministry at the request of the Central and North Durham Joint Town Planning Committee and an inspection had just been made of a possible site for a sea aerodrome near South Shields. Certain other municipalities (with whom the initiative rested in this matter) had under consideration the question of providing aerodromes in their vicinity, but no further concrete proposals had been communicated to the Air Ministry.

INSURING THE PILOT'S LICENCE.

Inasmuch as a commercial pilot may suffer the loss of his licence through some error of judgment, quite apart from culpable negligence or wilful breaches of Air Navigation Regulations, the British Aviation Insurance Group are now prepared to write a License Insurance Policy.

The policy covers loss of wages or earning capacity caused by temporary suspension of pilot's or navigator's licence at a given indemnity per week up to 26 weeks, or permanent suspension up to a maximum of £50. Loss of licence owing to wilful breaches of regulations or foolhardiness is excluded from the policy as it is not in the best interests of British aviation to encourage the taking of chances.

THE FLYING COACH.

A report in *The Times* of June 2 said that the Lord Mayor of London (Sir William Waterlow) and the Lady Mayoress flew from Paris to Croydon on Saturday in a specially chartered "16-seater Handley Page Rolls-Royce air liner" of Imperial Airways, the journey taking just under two hours. They left immediately for London to catch the Scotch express for Edinburgh, to attend a civic reception by the Lord Provost. [The description of the machine is that of *The Times*.—ED.]

NO JOY-RIDES OR FREE PUBLICITY.

The Air Ministry announces that a large number of applications have been received for passages or for the conveyance of freight on the proposed flight of the airship R.100 to Canada when she goes.

The public are informed that the flight to Canada and back will be of an official experimental flight, and no ordinary passengers or freight will therefore be carried, nor can applications for such facilities be dealt with by the Air Ministry. Mails will not be carried.

THE GRAF ZEPPELIN REACHES LAKEHURST.

The *Graf Zeppelin* which left Pernambuco on the morning of May 28 reached Lakehurst, New Jersey, on May 31 after a flight of 69 hours. The airship when over Barbadoes encountered an extraordinarily severe storm which caused Dr. Eckener to give up the proposed visit to Havana.

A certain amount of trouble was experienced at Lakehurst as a gust blew the aiship away from part of the handling crew some of whom were pulled off the ground and were injured when they dropped off the lines. Although various aircraft including the *Los Angeles* greeted the *Graf Zeppelin* on her arrival there were but few people to witness her landing.

The New York correspondent of *The Times* reports that during the storm two struts of the rear gondola were torn from their fastenings.

THE R.100.

In the House of Commons on May 28, in reply to questions by Dr. Morris-Jones and Mr. D. G. Somerville, the Under-Secretary of State for Air made the following statement:—

The trial flight of the R.100 was undertaken mainly to test the new engines installed for the Atlantic flight and the modifications to the outer cover wiring arrangements. The test was quite satisfactory as regards the engines, but on arrival at Cardington it was seen that the tail fairing piece, which is intended to improve the flow of air at the tail of the airship, was buckled, and subsequent inspection showed also that in one bay, behind one of the power cars, the force of the slipstream had damaged the cover and the securing wires and tapes. The failure of the fairing piece is due to its having been built of too light a gauge, and it will now be reconstructed in material of heavier gauge and with additional stiffening. The damage to the outer cover will be remedied by inserting intermediate girders in this bay, a method which has proved successful in other bays where trouble has been experienced. Although the damage was of a minor nature, and those on board the airship were unaware of it, the repair will take a little time, the new material having to be specially manufactured. Consequently, it has been necessary to postpone the flight to Canada until the end of June or beginning of July next.

Mr. Skelton asked that no further sums should be spent on these costly and useless machines and Mr. Churchill asked whether it was the policy of the Government to go on indefinitely pouring out money for these useless and costly machines. [One is sorry to disagree from Mr. Churchill and his friend, but these machines are neither useless nor costly when judged as experiments towards the development of airworthy craft of Imperial importance.—C. G. G]

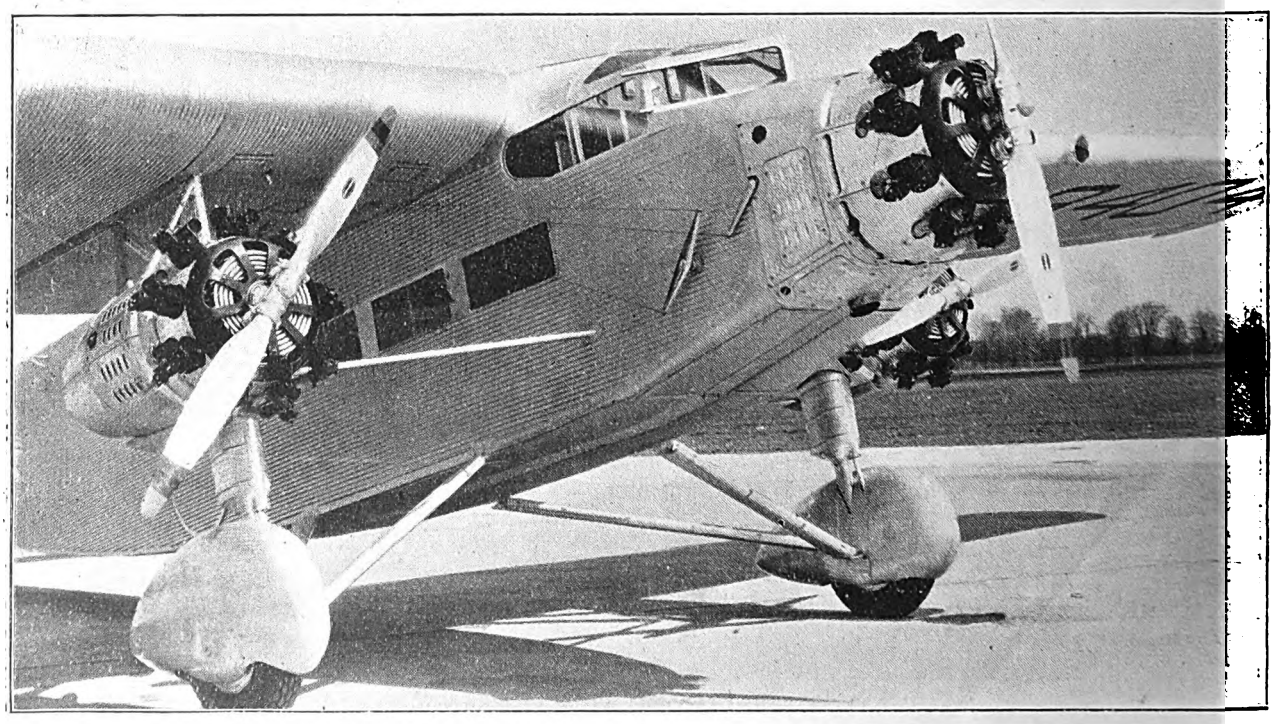
MORE TROUBLE.

The cloud into which the R.100 was alleged to have bumped by THE AEROPLANE last week must have been a hard centred one. Inspection has shown that the trouble was so serious as to delay the trip of the airship until the end of June or beginning of July.

U.S. NAVAL AIRCRAFT.

The Times of May 30 gives the following information about United States Naval Aircraft:—

The aircraft of the United States Navy are to be distinguished on a new system from July 1, 1930. This provides for (1) class designation, by an initial; (2) squadron identification by a number; and (3) fleet or station assignment, by an initial and perhaps a number. The class designations are:—B, bombing; O, observation; F, fighting; T,



COMPRESSION IGNITION.—The new Ford Tri-Motor with Packard-Diesel engines.

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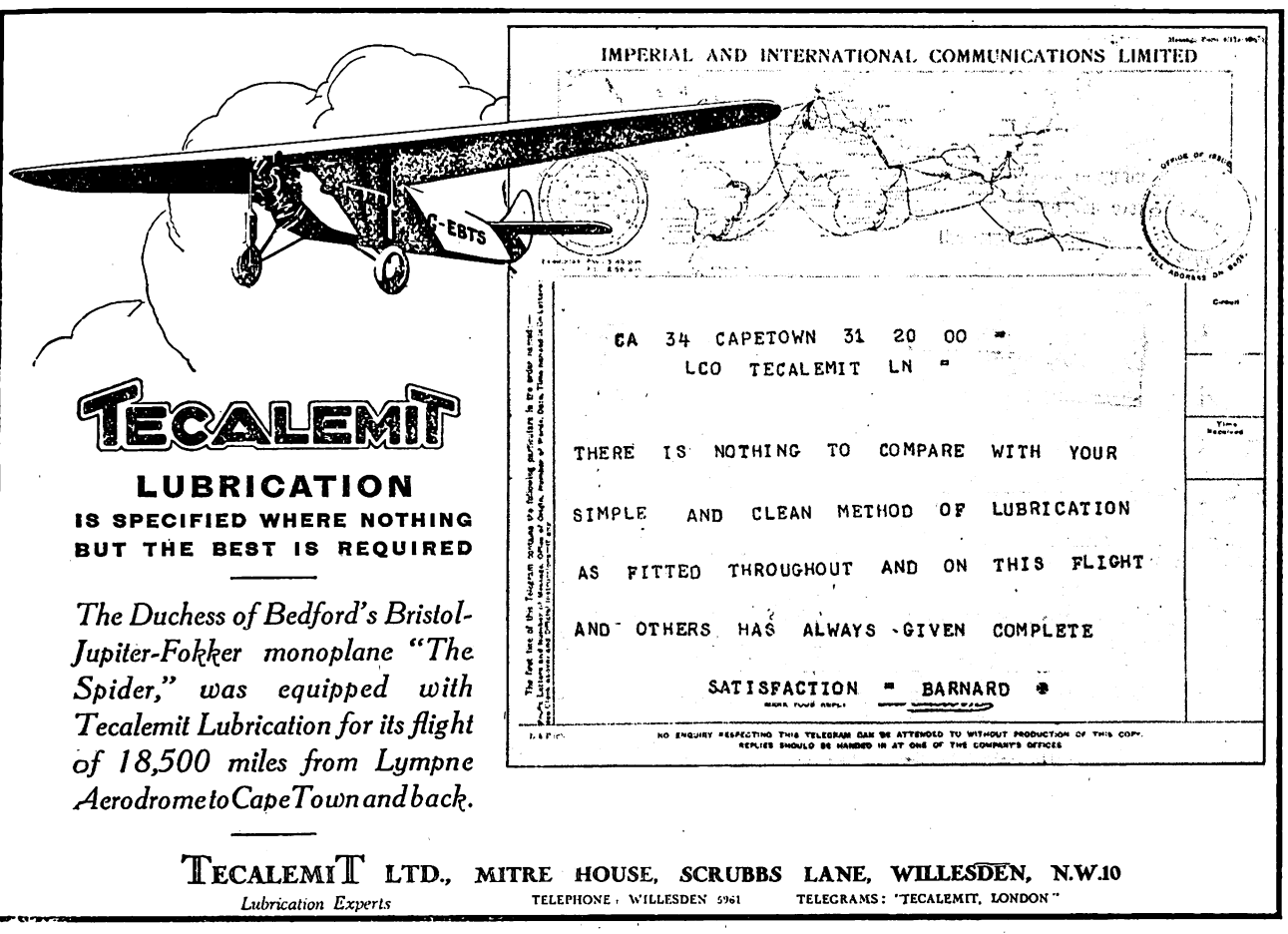

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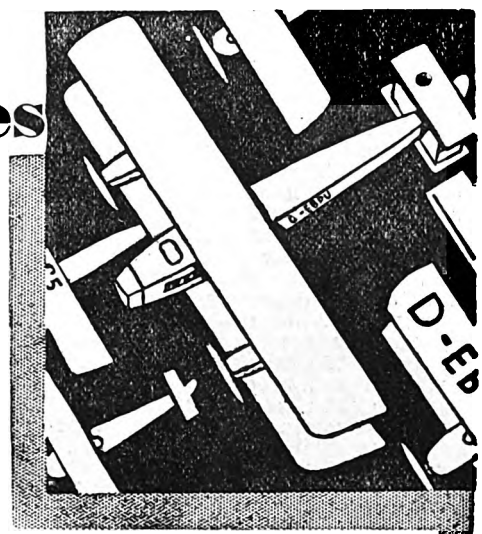

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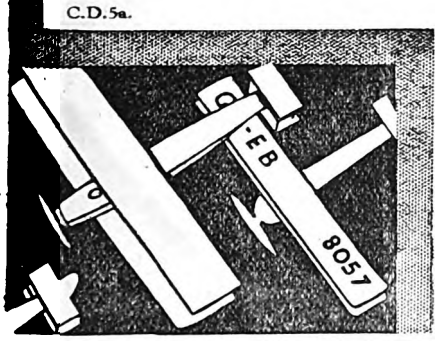

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torpedo; S, scouting; P, patrol; J, utility; N, training; and X, experimental. Then come the squadron numbers, from 1 onwards. The assignment letters are:—B, battle fleet; S, scouting; A, Asiatic fleet; F, fleet base force; C, control force; D, naval district, followed by the district number; M, marine corps; R, naval reserve; and X, experimental. As an example, the first observation squadron is VO-1; and if with the battle fleet it is styled VO-1B; if with the scouting fleet, VO-1S; or if attached to the third naval district, VO-1D3. Airships and kite-balloons will conform to this system. Rigid airships will be ZRS for scouting, ZRP for patrol, and so on; the non-rigid airships ZNS, ZNP, and so on.

[This seems to be either a mistake on the part of the sender of the report, or a piece of craziness on the part of the U.S. Navy Bureau. V stands for the products of Mr. Chance Vought,—and so for a make and not for a class. There might be several makes of observation ships in the Navy besides the Vought. And Z stands for Zeppelin, which is likewise a make and not a class,—so how can a non-rigid be a Z ship?—Ed.]

A STEP IN THE RIGHT DIRECTION.

The Postmaster-General announces that on and from June 2 the inclusive charge for air letters, etc., to any European country to which an air service is advertised will be 4d. for the first ounce and 3d. for each subsequent one. These charges will include ordinary postage and air fee.

The countries to which the uniform charges are applicable are:—Austria, Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Holland, Hungary, Italy, Norway, Poland, Russia, Sweden, and Switzerland.

This is to be welcomed as the introduction of a flat rate as opposed to a surcharge. The next step is to use air routes wherever possible instead of the slower and older means of mail transport, and that at the normal rates.

A NEW IRVIN AIR CHUTE FOR PRIVATE OWNERS.

The Irvin Air Chute of Gt. Britain Ltd., who manufacture the standard parachutes for the Royal Air Force, announce a new parachute, which has been specially produced for private owners and air travellers generally. It is appropriately called "The Caterpillar Air Chute," taking this name from the International Caterpillar Club, which is the exclusive club of airmen or airwomen who save their lives with an Irvin Air Chute. Its membership is nearly 300.

Private owners, members of flying clubs, and all associated with civil flying are now such an important section of aviation that the need for study of their requirements is evident. It is seen that the equipment they have had to fall back upon (or fall down upon) does not meet their purpose and they are creating their own special conditions.

Already in several types of light aeroplanes, Gipsy-Moths and Blackburn Bluebirds for example, parachute seats are standard. Incidentally, one may mention here that owners of aircraft which are not fitted with these seats are not thereby prevented from wearing a parachute. The only reason that a special seat is now being fitted is for the comfort of the wearer of a parachute. Ordinary seats are usually flat, and therefore do not hold a pack firmly.

In designing the new parachute the Irvin Air Chute of Gt. Britain Ltd. set themselves fixed objectives. First, the Caterpillar Air Chute had to be produced with the same high quality of workmanship as in their standard parachutes. And the Caterpillar Air Chute had to be cheaper.

The Caterpillar Air Chute is an all-silk parachute, like the standard types. That is most important to note. It is possible to produce a good and fairly reliable parachute with cotton, but it remains inferior to a silk parachute, whatever advantage it may have in cheapness. The tearing strength of silk is far higher than that of cotton; so to maintain a high degree of strength and therefore a high factor of safety the Caterpillar Air Chute is all silk.

Another important feature is its performance. It descends slower than the ordinary types. This will hearten many potential parachutists.

But the next most important consideration in this parachute is its price. It only costs £60, which represents a considerable reduction in the price of standard air chutes.

The Caterpillar Air Chute is identical in size and weight with the other types. It fits in the same size pack and it embodies the same method of operation. Anyone using a Caterpillar after using other Irvin types will find no difference except in the price and the rate of descent.

A standard back pad is supplied with the Caterpillar Air Chute, which fits in the usual way underneath the back section of the harness and on the airman's back. But this pad gives another advantage besides comfort. It holds the Caterpillar Air Chute across the back of the cockpit seat so that the aviator may always keep his chute in the cockpit and simply slip into the harness as he sits down, as simply and conveniently as securing the safety belt.

MANY INVENTIONS.

Mr. O. P. Jones, who flew the Prime Minister to Edinburgh recently, afterwards went on to Glasgow, where, in three days, he carried 3,200 joy-riders in G-AACI.

27,000 persons paid for admission to Renfrew Aerodrome on that occasion, but vast throngs (of pure Scots blood) observed the proceedings from various neighbouring summits, and enjoyed it all, the more because the bawbee remained in the pouch or sporran.

G-EBIX, piloted by Mr. Jimmy Youell, brought the Lord Mayor, Lady Mayoress and party from Paris, early on Saturday morning, May 31. The official Turtle, with mace, jewelled soup-ladle, three-cornered top hat and chain of office, is rumoured on untrustworthy authority, to have met the party at Croydon. Owing to essential parts of this reptile's regalia being in the wash, pathetic scenes were witnessed when Mr. Organ P. Golley was bereft of his spats, which were then fitted to the Mayoral Turtle.

About what constitutes an all-weather cockpit controversy rages long and loud here. A certain taxi-machine has a totally enclosed cockpit which lets all weather in, but the pilots somewhat unreasonably maintain that it should keep the weather out. Recently a pilot was darn nigh drowned when flying this machine in a rainstorm, and artificial respiration (during which he inhaled a pint of bitter and three pink gins) had to be resorted to.

The Ground Staff point out that there is a plimsoll, or high tide mark in this cockpit, situated about the level of the pilot's eyebrows, and that when the cockpit fills to this height, all the pilot has to do is to fire three red, two green and one white Verey's lights and abandon ship.

Derby results were broadcast to passengers on Wednesday, in the Silver Wing, Imperial Airways Paris machine. A gentleman, said to be Mr. Harry Cobean, the famous Agriculturalist, stated that he could distinctly hear the clop-clop of hooves and the hard breathing of jockeys (one of whom had bronchial catarrh and made unseemly whistling noises) above the soft purr or sibilant murmur of the Jaguar engines. It later transpired that no such person as Mr. Cobean travelled, that no jockey had catarrh, and that nobody heard any hoof-beats anyhow, and this story is thought to have been invented by some unprincipled penny-a-liner trying to make up space. [And anyhow, it was received in this office the day before the Derby was run.—Ed.]

On Saturday, May 31, while Bristol was somewhat enshrouded in gloom (except the refreshment tents), K.L.M. had a highly successful afternoon at Croydon when about 140 business friends of the Firm were taken for short flights in he new Fokker F.IX and in an F.VIII. They were then entertained to tea at the Aerodrome Hotel.

The previous Saturday Air Union held a similar ceremony when guests were flown from Croydon to Hanworth Park, where a most enjoyable dinner and dance were held.

Lt.-Col. Henderson was joy-riding here all day on Sunday, taking up six passengers a time in his Jupiter Junkers G-EBZV, late the property of the Hon. F. E. Guest.

Mr. Jock Anderson made use of his magnetic personality to get people to fly, and we were nearly pushed into the cabin of the Junkers ourselves, by his nimble wiles, escaping at the last moment only because a wealthier-looking person who would pay without arguing hove up in the vicinity.

There is no doubt that a cabin machine has a definite attraction for joy-riders, though a large section of the community prefer open-cockpit flying, especially in fine weather.

On Sunday Surrey Flying Services also had all the joy-riding work to do they could manage between dawn and dusk. And Col. Henderson took over 170 people up during Sunday's daylight hours.

A business man, wishing to attend an important conference in Madrid, flew there in an Imperial Airways taxi, piloted by Mr. Gordon P. Olley, last Friday. While the business man was hard at work on Saturday his pilot was able to bask in the sun amidst orange, olive and onion (Spanish) groves. On Sunday the return flight to Croydon was made. Mr. Olley is pleasantly sunburned and still smells faintly of garlic.—SPRY.

Fit "TripleX" Regd -and be safe!
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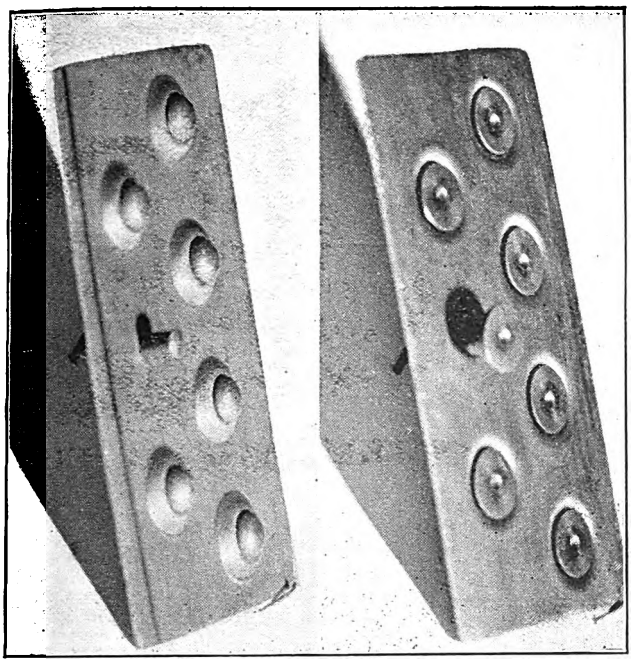


BOTH SIDES OF THE PICTURE.—Showing both sides of a rivetted joint with one rivet still to be closed.

A NEW RIVETTING PROCESS.

An ingenious method of increasing the bearing areas of rivets without increasing the size of or the weight of the rivet has recently been evolved. This is known as the De Bergue Countersunk Rivetting Process and has the further advantage that the rivet-heads are countersunk. The method offers a satisfactory means of rivetting the thinnest gauge sheets, as the shearing stresses are taken not by the shank of the rivet but by the material itself, which is depressed into tightly fitting cups the sides of which take the shear.

The result of this system is that the strength of the joint is doubled without increase of weight, with the additional advantage of a flush surface.

The rivetting operation is done by a small De Bergue Pneumatic Rivetting machine at about the same speed as normal light machine rivetting. Special rivets are used which resemble, if one can so describe them, an inverted panhead rivet,—that is the top diameter of the head is greater than that of the underside of the head.

This rivet is placed through the hole in the sheets and the original flat rivet head is placed on the flat surface of the bottom rivetting tool.—Perhaps one should explain here that the De Bergue Pneumatic Rivetting Machines are of the squeeze type and have therefore two closing tools, that is a fixed tool and a moving one.

The moving, or top, tool has a specially shaped cupped head and closes over the projecting shank of the rivet. With one quick squeeze two simultaneous actions are caused. Firstly the rivet head is forced flat into the two sheets which sink together into the cup shape which is formed in, and by the top tool, without otherwise distorting the sheets which remain true. Secondly, the depression in the top tool forms a cup-head on the rivet-shank, which thus completes the job.

The De Bergue 13-ton rivetting machine No. 95 is recommended for this work, the gap between the jaws is 18 inches deep by 7¼ inches wide and the machine is fixed on a stand. The free air consumption is 1.33 cub. ft. per rivet. De Bergue and Co. Ltd. of Strangeways Iron Works, Manchester, are well known as manufacturers of a great variety of rivetting equipment. One has merely indicated the tool best suited for this patent rivetting process and refrained from catalogueing their complete range.

One would suggest that the firm should study a method of putting these rivets into closed structures like floats, fuselages and the hulls of flying boats, in which the production of flush-rivetted joints would be of particular advantage.

THE PERILS OF AIR SURVEY.

The other day an experienced pilot in the London District was making a survey tour of outer London to see whether he could find a really good site for yet another aerodrome, as the air over the aerodrome from which he operates is becoming uncomfortably crowded. Flying along one of the new bye-pass roads he found a number of fields which looked promising, so he proceeded to do trial approaches to these fields, gliding down to about 50 ft. and then starting up again.

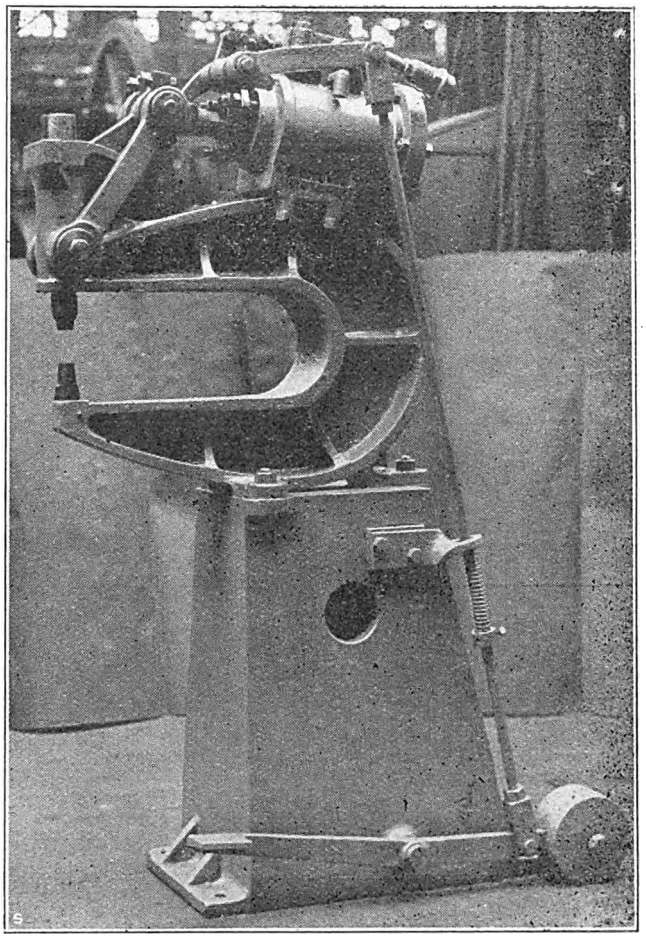
A local householder seeing this performance took the pilot's number and reported him to the local police for dangerous flying, sincerely under the impression that he was diving onto the cars on the bye-pass and onto people in the fields along the road, and so making himself thoroughly objectionable. The affair has now been explained to the full satisfaction of the Air Ministry and of the local police. But it only shows how careful even the best of us have to be.

COMPARATIVE FIGURES.

A White Paper (Cmd. 3576, price 1d.) issued last week shows that the number of foreigners landing in the United Kingdom during the first three months of the year was 69,197. Most of them were visitors on holiday and business. This is an increase of 3,214 upon the corresponding quarter of 1929.

Of the total 990 arrived and 999 embarked at air stations in the United Kingdam. Which shows how small a thing air transport still is compared with sea traffic.

The number of aliens embarked was 63,040. Leave to land was refused in 483 cases this year, compared with 376 in the corresponding three months of last year.



THE DE BERGUE SQUEEZE RIVETTER.—No. 95, 13-ton type, which is recommended for the new form of rivetting.

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AIR UNION REDUCTION FOR WHITSUN.

Air Union announces a general reduction on all tickets for the London—Paris—London service over the Whitsuntide period. The rates from June 4 to June 12, inclusive, for any Paris return ticket will be £7 instead of the lowest usual single rate each way of four guineas.

The machines will be the usual Air Union equipment on this run, Golden Ray twin-engined Loiré et Olivier biplanes of 1,000 h.p. which are among the fastest and most comfortable in use on the Channel route, also the Farman Goliaths (two Gnôme-Rhône Jupiters).

THE DESOUTTER CARRIES MORE.

The Desoutter Sports Coupé has now been granted a Certificate of Airworthiness for normal flying at the increased weight of 1,900 lbs. This gives another 100 lbs. to play with, as the machine was previously certified for 1,800 lbs.

The machine has also been granted an aerobatic Certificate of Airworthiness for a load of 1,550 lbs. Those who have seen the classic performance of Flt. Lt. Schofield in a Desoutter will agree that the machine has earned it.

AIRCRAFT POSTCARDS.

A new series of twelve postcards by the Aircraft and Fine Art Company illustrates twelve types of British Aircraft in colours from the brush of Mr. A. Johns. The series includes the Argosy, Supermarine Southampton, Short Calcutta, Hawker Horsley, Supermarine S.6, Blackburn Sydney, Desoutter, Bristol Bulldog, Hawker Hart, Westland Wizard, Hawker Hart, Comper Swift, and the Prince of Wales' private Moth.

Besides being attractive in colouring these pictures are accurate in detail. They may be got from the Aircraft and Fine Art Company, East Grinstead, Sussex.

A GOOD DOUBLE.

Kayser, Ellison and Co. Ltd., the famous steel makers, have received the following from the De Havilland Aircraft Co. Ltd.

We are glad to be able to tell you that the valves in Miss Johnson's D.H. Gipsy-Moth were made from your Special Heat-Resisting Steel and congratulate you on their durability.

The valves of Miss Johnson's Gipsy Engine as those in the Cirrus Engine which was used by Mr. Bert Hinkler on record 15½-day flight to Australia in 1928, were made from Kayser, Ellison's own K.E. 965 steel. On this previous occasion the firm received a telegram as follows:—

Must tell you valves your manufacture fitted to my Cirrus motor gave excellent results throughout trip—examination at Darwin showed them require no further attention—congratulations—Hinkler.

NEW COMPANIES.

WALCOT AIR LINE LTD.—Private company. Registered May 16. Capital, £10,000 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in, hirers of and letters to hire and repairers of aeroplanes, hydroplanes, airships, balloons, aeronautical apparatus, motor-cars, motor-cycles and carriages, engineers, etc. The directors are: C. E. Seton, 7, Baker Street, W.1, leather goods manufacturer. W. G. Anthony, 43, Augusta Gardens, Folkestone, landowner. L. Stanley, The Close, Thames Ditton, C.A. Secretary: F. C. Parsons. Registered office: 5, South Street, Finsbury, E.C.3.

SEALANDAIR LIMITED.—Private company. Registered May 14. Capital £1,000 in 1s. shares. Objects: to carry on the business of designers, manufacturers, importers and exporters of and dealers in motor-cars, motor-omnibuses, coaches, char-a-banc, taxis, lorries, vans, and other automobiles, monoplanes and any other kinds of aeroplanes; motor and general boat proprietors, etc.

The subscribers (each with one share) are:—R. Bastwood, 264, Elgin Avenue, W. 9, Secretary, E. E. Beaton, 19, Browning Avenue, Sutton, Surrey, clerk. Secretary: R. Eastwood.

SATISFACTIONS.

BRITISH INDESTRUCTO GLASS LTD.—Satisfaction to the extent of £2,076 16s. 10d. on May 7, 1930, on deposit of deeds without instrument on Dec. 20, 1929, and registered Jan. 8, 1930.

PERSONAL NOTICES.

MARRIAGES.

BERRYMAN—SHIPTON.—On May 9, at Bombay, Patrick Edwin Berryman, R.A.F., son of Mr. and Mrs. A. Cassels Berryman, of Berkhamsted, Herts, to Edith Kathleen (Kitty) Shipton, daughter of the late Leonard Shipton, Ceylon Government Service, and Mrs. Shipton, of Bedford.

DUMINY—STEWART.—On May 24, in London, Flt. Lt. John Duminy, R.A.F., to Janet Ramsay, elder daughter of Mr. and Mrs. Allan Stewart, Bonally, Kenley, Surrey.

LANDON—WARREN.—On June 2, at Wing, Bucks, Group Capt. J. H. A. Landon, D.S.O., O.B.E., R.A.F., only son of Colonel and Mrs. Landon, The Old Cottage, Brentwood, Essex, to Biddy, younger daughter of Col. T. R. P. Warren, C.B.E., Chief Constable of Buckinghamshire, and Mrs. T. R. P. Warren, of Wing Lodge, Bucks.

FORTHCOMING MARRIAGE.

ALLEN—UTTERSON.—A marriage has been arranged between Wing Cdr. Dermott L. Allen, A.F.C., R.A.F., third son of Mr. Robert Allen, St. Ewolds, Jersey, and of the late Mrs. Allen, and Beatrice H. Utterson, widow of Lieut.-Col. H. K. Utterson, D.S.O., The Dorsetshire Regiment, and elder daughter of Sir Claude H. Hill, K.C.S.I., C.I.E., Lieutenant-Governor of the Isle of Man, and of Lady Hill.

BIRTHS.

SMITH.—On May 26, at The Elms, Ford, Salisbury, to May, wife of Flt. Lt. S. B. S. Smith, R.A.F. Medical Service—a daughter.

WAGHORN.—On May 29, at The Bourne Ridge, Farnham, Surrey, to Dollie, the wife of Flt. Lt. H. R. D. Waghorn, A.F.C., R.A.F.—a son.

Miss Amy Johnson used

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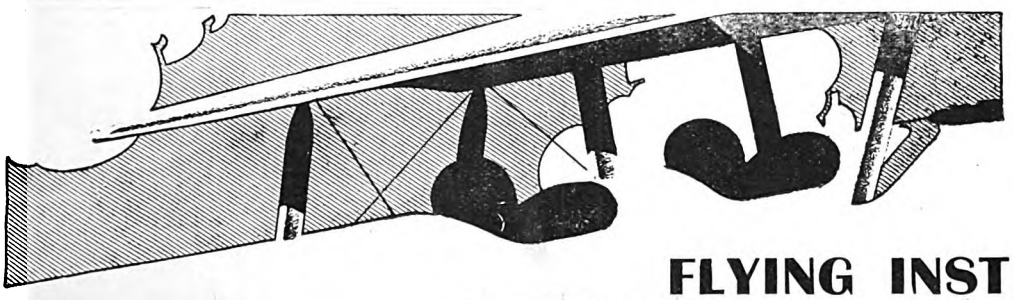

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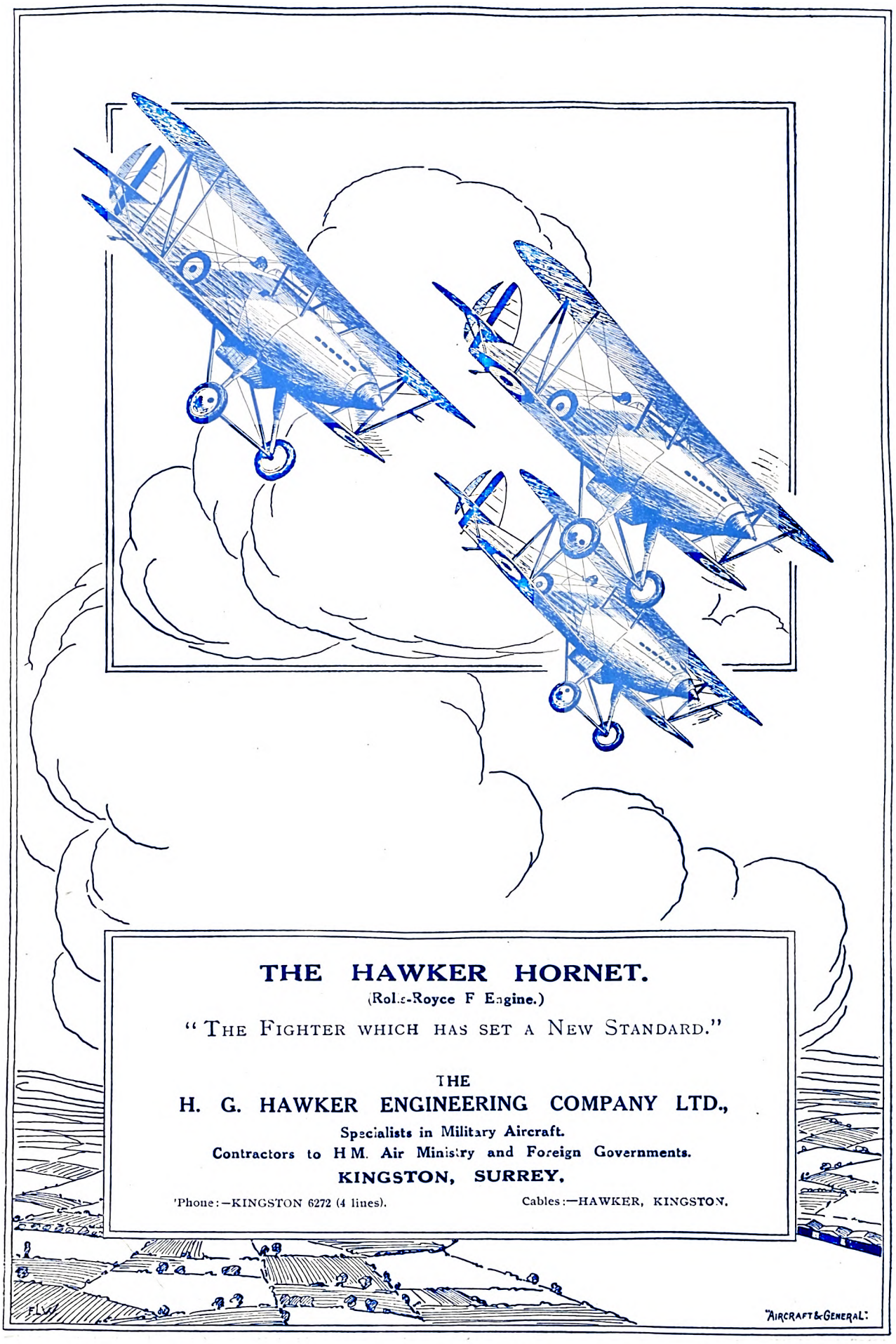

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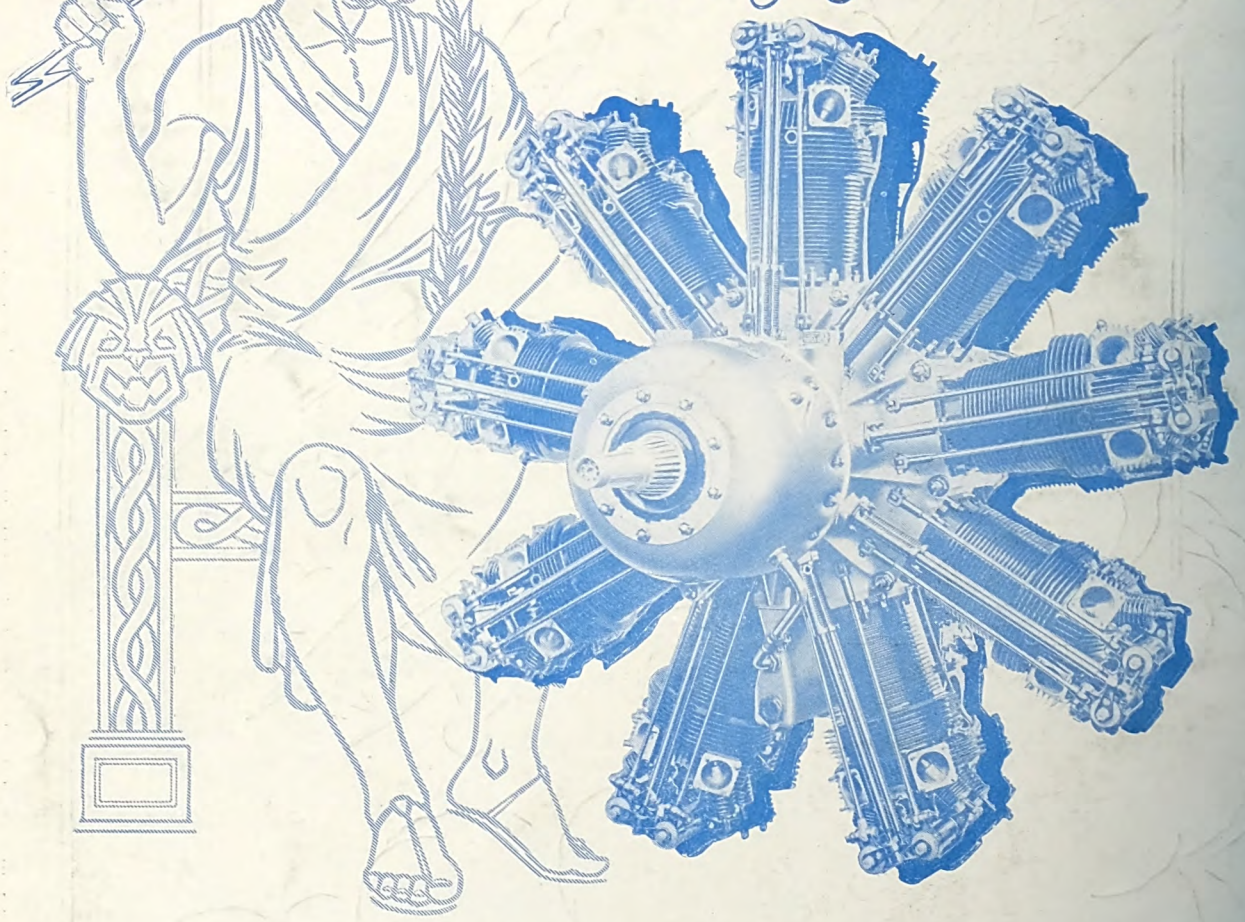

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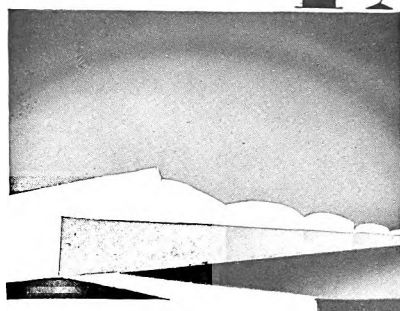

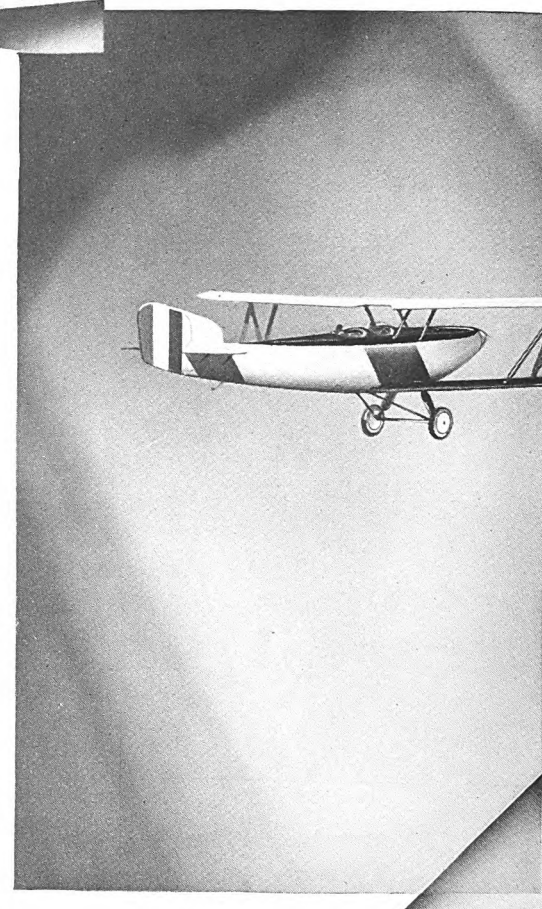

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ON A BUSMAN'S HOLIDAY.

An Allegory.

Somewhere about fifty years ago there was an Irishman by the name of Foley who had a high-pitched voice that would sing "Kathleen Mavourneen" till you really believed that it might be for years and it might be for ever. But he made very little money. So he went to Italy and studied, and a few years later London Society was devastated by an Italian called Signor Foli, a gas-jet tenor, who warbled about mobile donnas and such-like, and died leaving a handsome fortune.

Somewhat likewise, there was a lad by the name of Tony Dooley, as fine a dancer as ever won a first for reels at a *Feis Ceoil,* or was an epicure about his shoes. And he also made no money. But, thanks to a course of Diaghileff Ballets and Baksht *décors,* Anton Dolin is one of the World's greatest Russian dancers.

English gliding is something like that,—and so is much of the rest of British Aviation.

British Gliding.

In October 1922, contrary to all meteorological experiences, there was half a gale from the north-east, and a lot of British aviators who had expected to do long hops in gliders down the southward slopes of Itford Hill found themselves soaring for minutes, and even for hours, on the howling chimneys made by the cups cut away by erosion in the steep northward faces of the ridge from Itford to Firle.

A little Frenchman named Maneyrol, in a quite impossible flying-machine, sat on the upcurrents for three hours or more, and Sq. Ldr. Alec Gray (formerly commanding 55 Squadron, R.A.F.) sat there nearly as long in a contraption made up of a German Fokker wing fixed onto a sawed-off fuselage of a Bristol Fighter. And both landed, long after dark, on top of the ridge, *above* where they started, by the lights of motor-lamps, merely because everybody was bored with waiting for them, and told them so, both long and loud.

Also, Mr. Freddy Raynham, one of our pioneer pilots, and sundry others, soared and glided and did all those things which are now being hailed as World-discoveries by the daily Press here and in America.

Gliding and soaring have been discovered again simply because we here have been too lazy to go on with it as a sport and too stupid to take it up seriously as a method of scientific research. So we have had to import at great expense a perfectly charming Austrian, named Kronfeld, who is, of course, called a German by the daily papers, to teach us what we ought to have known seven years ago if we had gone on instead of leaving off.

So far as one can discover, the only people who have got any good out of the lessons of Itford in 1922 are some R.A.F. people who were serving in India soon afterwards. Their job was to bomb certain targets in Waziristan. They had to start from a hot valley, and circle round and round in it to get enough height to clear a line of cliffs on the far (and always the down-wind) side of the valley.

When they had got their height, with the old-type Bristol Fighters, they had just enough petrol left to get to their objective and back, if the wind did not increase. If it did they sometimes scraped back over the cliffs and landed in the valley, and once or twice a machine was forced by shortage of petrol to land in the mountains, where the friendliness of the population was doubtful.

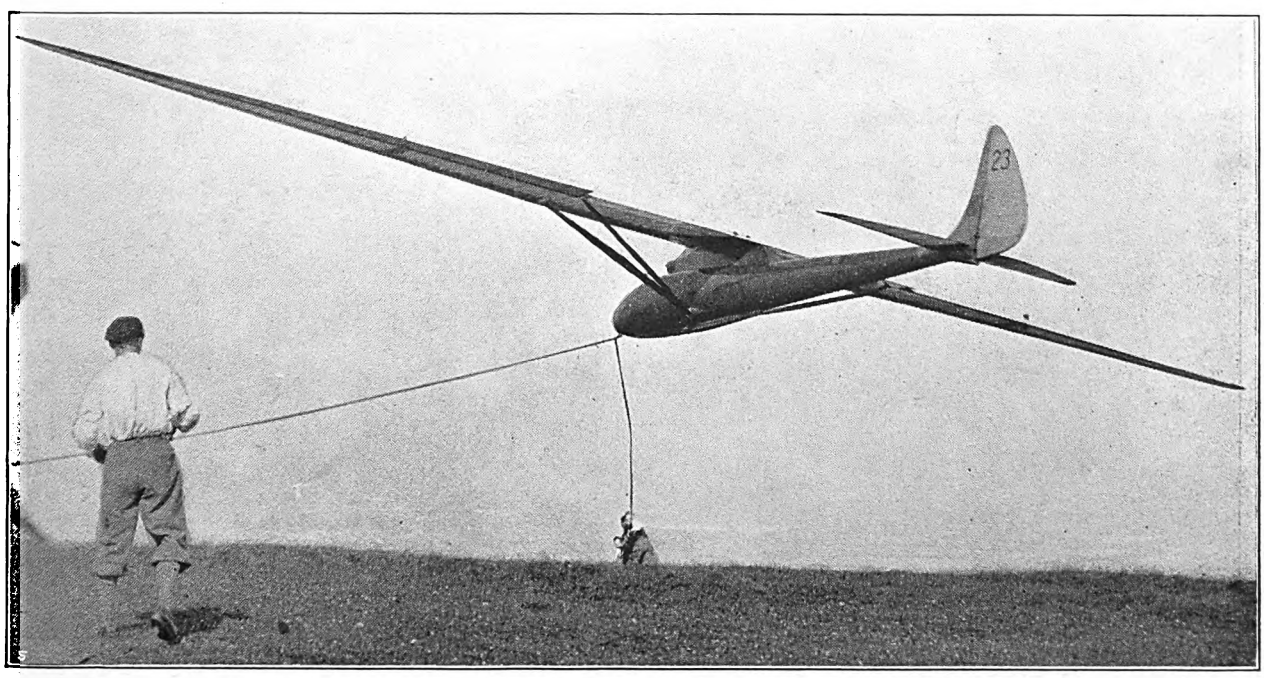
Then one day some bright lad thought of Itford and its up-currents. So, instead of circling the valley for half-an-hour or more, he flew straight down-wind to the other side, turned round facing the wind, with his tail as near the face of the cliff as he dared to go, throttled back, pulled the nose of the machine up, and just went up like a lift. He found himself at the top with something like an hour's petrol to spare.

After that the rest of the squadron made a habit of soaring up the cliff, and there was no more anxiety about shortage of petrol on the homeward journey, and there were no more cracked-up Bristols in the valley.

Apart from that, all that the 1922 Itford show did for us

"WAFTED ON DARING ART'S FICTITIOUS PLUME."

(*Virgil on Daedalus*—Translated by Father Prout.)



OVER THE EDGE.—Herr Kronfeld in the "Wien" being launched from Itford Hill.

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was to produce a competition for perfectly useless aeroplanes, because some people thought foolishly that a practical aircraft could be made by putting an engine into and a landing-carriage under a glider. And ultimately we developed light aeroplanes rather like pre-War B.Es, somewhat lightened and with more reliable engines.

Let us hope that Herr Kronfeld's beautiful *Wien* may put us onto fresh lines of thought. The new Puss Moth and the Segrave Meteor show that we are thinking in the right direction. A little further along the same lines, and a return to our old ideas of the importance of aspect ratio, and we may find ourselves going ahead quite suddenly with our power-driven aeroplanes.

A Holiday Task.

By way of having a complete holiday from Aviation, after several weeks of over-work one retired to Sussex for the Whit Holiday week-end, and out of mere vulgar curiosity to see what all this newspaper excitement about sail-planing meant, one scaled again the heights of Firle Beacon, in the editorial American automobile, and drove along the ridge to the old familiar gliding site on Itford Hill.

A Point of Law.

Incidentally, a rather pretty legal question seems to arise here. The land on the Downs belongs to Viscount Gage. But seemingly there is a right of way along the ridge, as is shown by well-established tracks and by the fact that there is no barrier at the top of the road from Firle Village where it debouches onto the open Downs. And the local people and all visitors have always had free access to Firle Beacon and Itford Hill and the whole ridge. Also, there is at the entrance to the sacred ground of the Seaford Golf Club a notice which reads "Right of Way to Firle."

That being so, what right had some person or persons unknown,—perhaps the British Gliding Association, perhaps *The Daily Express*, perhaps somebody else, to station men at the top of the hill to demand half-a-crown from all cars using the track to Itford? And what right had these, or some other, persons to demand further payment to pass the last gate to the Itford plateau?

One is not denying the right. One is merely asking for information. If the money goes to the British Gliding Association, so much the better for the Association. But, if someone who makes a hobby of upholding the rights of the public had called what looked very like a bluff, and the affair had been taken into Court, the result would at any rate have been instructive. And certainly a good many thousands of foot-passengers reached the sacred enclosure at Itford without saying By-your-leave or Thank-you to anybody.

The Head-Centre.

At the camp on Itford one found, naturally, the British Gliding Association in full force. Col. the Master of Sempill, the Chairman, President, or/and whatnot, was as energetic and ubiquitous as could be. Just how he manages to do so much for British Aviation without fee or reward besides all the hard work he puts in at his own business is one of life's mysteries.

He has made the Royal Aeronautical Society in the past three years into a real power in the World, after its members had become as lethargic as the population of the Silence Room of the Athenæum Club. He has been the moving spirit in organising banquets to and for various deserving people and objects. In fact he and his wife between them (taking into consideration all that the Hon. Mrs. Forbes-Sempill has done for the Air League and the Forum Club, as well as for the R.Ae.S.) have been the chief energisers of British Aviation of late.

Anyhow, when one arrived at the camp Col. Sempill was busy directing some form of Noise Unit on a lorry where to station itself so as best to broadcast assorted information and alleged music. He was also arranging a laager of cars round an extinct dew-pond, for a lunch-party. He was re-arranging the housing, or tenting, or hangaring, of various gliders, so as to allow a damaged British machine to be repaired in peace. And in between he was telling the semi-converted (of whom one was one, as it were) all about the usefulness of gliding. He seems to be able to go on for ever with all these jobs. At this rate he will have to change the family motto to "Sempill Sempiternus" or something of that sort.

Some Pioneers.

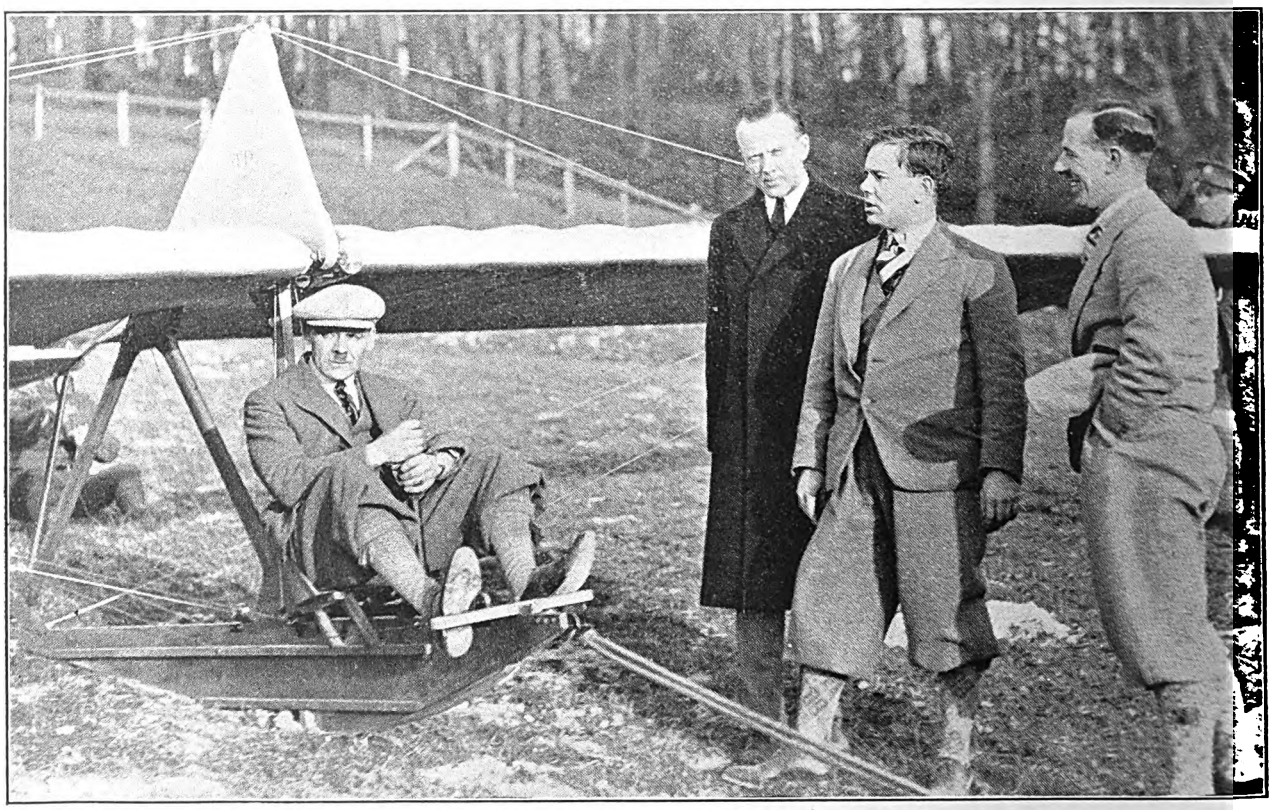
About the next person one met was Mr. Eric Gordon England, once a pioneer aviator and now World-famous as a builder of bodies for automobiles. Among his other accomplishments he has about the best broadcasting voice and manner one has heard.

Actually, unless one's dates are a bit out, Mr. England is (or was) the first Englishman to fly, for one believes that his amazing glides in the bird-like Weiss gliders from Amberley Mount near Arundel were made long before either Mr. J. T. C. Moore-Brabazon or Mr. A. V. Roe or Mr. S. F. Cody made their variously disputed power-driven hops.

One of his glides landed him over a mile from his starting place. And those old cantilever monoplane gliders designed and built by José Weiss are worth studying to-day. They were only about 25 years too early.

Also there was Marcus Manton, now a prominent gliding expert, after having taught the art of flying to lots of men who are now senior officers of the R.A.F.

The first person launched after our arrival was Mr. Lowe-Wylde on the Kentish club's Zogling (or training machine), and a War-pilot of experience. He plunged fearsomely over the edge of the cliff, battled with the breeze like a Union Jack, and sat down on a lower shelf of the hill a few hundred yards to leeward. An assistant-conspirator remarked that not for nothing were his names low and wild,



PIONEERS OF BRITISH GLIDING (OLD AND NEW).—Left to right, Mr. Marcus Manton, Col. the Master of Sempill, Mr. Ashwell Cooke, and Mr. C. H. Latimer- Needham.

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—and he very nearly followed Mr. Wylde over the cliff without a glider.

Whereupon Wing-Commander George Pretyman, one of the earlist R.F.C. pilots, remarked gloomily that as he was the next on the list to be catapulted in the same machine he woul probably not be a pretty man to behold if the Zogling had been damaged by Mr. Wylde in what looked like a bumpy landing. All the same he made a very good glide to a point a hundred feet or so below,—whence the machine was retrieved by a Citroen-Kegresse tractor which seems to like descending a slope of about one-in-one and hauling things up it.

THE SOARERS.

Meanwhile Herr Magersuppe—whose name is easiest remembered because it has nothing to do with Maggi's Soups—had been giving a pretty show on a real *segelflugapparat*, or sail-plane or soaring machine, boldly displaying the name of *The Daily Express*, by which enterprising journal he and it had been imported. It was quite a pretty show. And his landing was like that of an Autumn leaf.

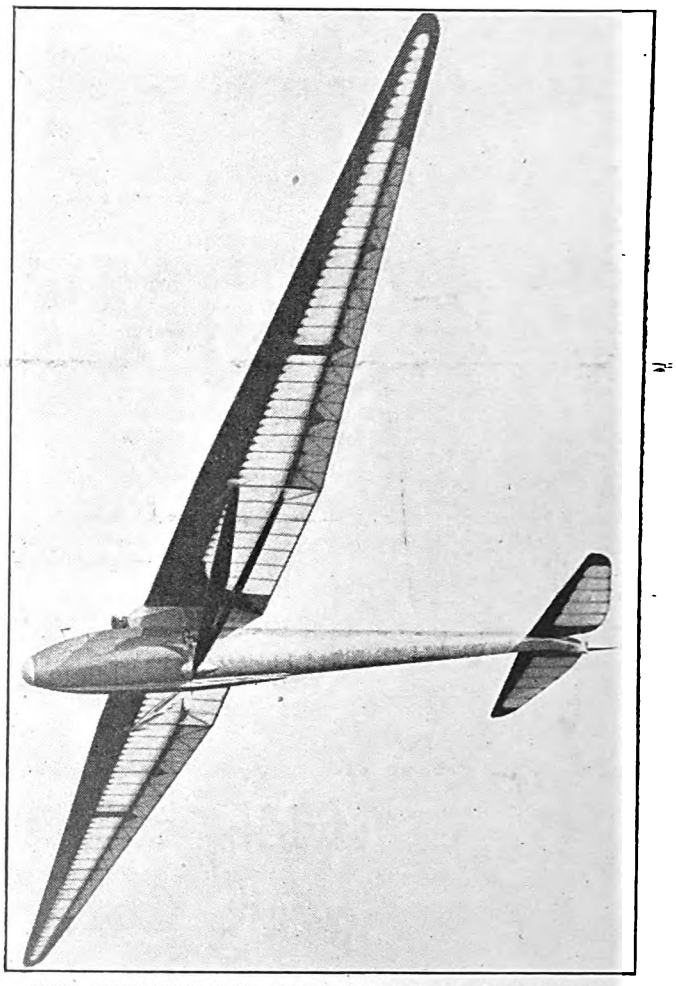
Then one inspected the Prufling, or secondary training machine, bought from the Kegel firm by the British Gliding Association, and sold on hire-purchase to the London Gliding Club.

On it, the previous day, Mr. Latimer-Needham of Halton had done some real soaring while the wind was blowing straight into the Itford cup. On such days at Firle you could soar on a tea-tray. But Itford is less efficient.

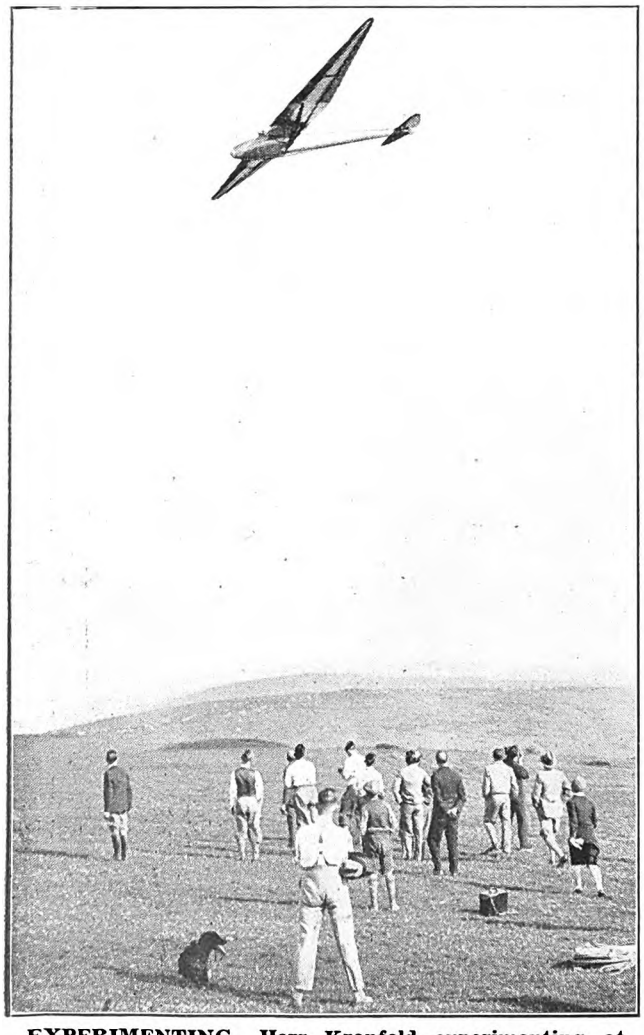
On Sunday the wind had gone off a trifle to the East which was not so good. And early that morning Mr. Needham had tried another soar with disastrous results. He had landed on a wing-tip and cart-wheeled so that he had pushed his head into the centre section and the control-column into himself, and was completely knocked out for some minutes. Happily he was all right next day, but, the Prufling was not, and he was, as another criminal remarked, sorer than a soarer should be.

SOME VISITORS.

After that one found more visitors from the power-driven branch of aviation. Lady Bailey was there with some of her family, and her Sunbeam car. Sir Alan and Lady Cobham and sons and Mrs. Cobham (Sir Alan's mother) came in a very smart Siddeley. And there were lots of pilots of the R.A.F. and Civil Aviation, among them Mr. Christopher Clarkson, late of the C.F.S., who had come to see what testing a glider looked like.



THE RECORDMAN.—The "Wien" at close quarters.



EXPERIMENTING.—Herr Kronfeld experimenting at Itford before the public show.

Also there was Howard Wright, one of the real pioneers, who built an aeroplane for Sig. Caproni in 1908 in a railway arch at Battersea, next door to the Dog's Home, and built hundreds of aeroplanes in the next ten years, and is now carbonising coal at low temperatures and, one hopes, high profits.

And there was S. V. Sippe, who bombed Friedrichshafen in November 1914, and forsook Aviation a few years ago, and looks more like a millionaire than ever.

Altogether it was a regular Gathering of the Clans, past, present and future. And it was very good fun. Added to which, barring the howling gale which made the tents flap like pistol-shots, and whistled through the spokes of the cars, it was all so nice and quiet without those noisy engines which so spoil conversation at other flying meetings.

THE RECORDMAN.

The real key to the whole gathering was the performance of Herr Kronfeld and his record-breaking glider, the *Wien*. It is a beautiful piece of work, as was admitted even by Mr. Camm, of the Hawker Engineering Co., who, as the designer of the R.A.F.'s newest fighter, the Hornet, which does about 220 m.p.h., is no mean judge of streamlining and finish.

During lunch (for which thanks to Lady Cobham and Mrs. Sempill) one had a talk with Herr Kronfeld—who speaks excellent English. He is the perfect example of the perfect glider-pilot. Everything he does is done to learn something. The only thing that bores him is a duration contest, when there is nothing to do but sit.

He was delighted because the previous evening he had met some clouds of a sort which were new to him. He and Mr. Entwistle, of the Air Ministry (our old friend the Gust-guesser of 1922, back in his old haunts) had argued whether such clouds were likely to give any lift or not. And they both thought not.

So he waited till the clouds came near. Then he went up on the ordinary up-current from the cliff and caught their draught. To his joy he found that they gave a good lift, and he reached them at about 3,000 feet, but did not go right into them for fear of losing sight of the ground and being drifted out to sea. Still, he had learned something new, and that made the trip worth while.

Herr Kronfeld says that though you can tell pretty well from the look of a cloud whether it will give a lift or not, you cannot tell whether you will get the lift from the front or the back of the cloud. And sometimes, when there is a

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Extract from a letter received from A/S Norsk Lufttransport, an aircraft operating Company in Norway.

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strong wind the lift caused by the cloud may be found after the cloud has passed over, because the drag of the ground causes the air-current to lag behind the cloud itself. Evidently this cloud-soaring is a highly fascinating study and very good sport.

The *Wien* itself ought to be studied by all aircraft designers. It has a span of 65 feet and an average chord of about 4 ft. Its gliding angle is said to be about one-in-thirty, and its speed-variation is great. Herr Kronfeld says it glides at anything between about 25 m.p.h. and 50 m.p.h., as required, and lands at about 12 m.p.h.

He carries an altimeter, an air-speed indicator, and a statoscope (to show quickly whether the machine is ascending or descending), but he says that mostly he flies by the feel of the machine. Which seems the best way, seeing that there is no motor to interfere with the pilot's feel of it. Also, he carries a parachute—which seems wise.

One can only hope that all those who are interested in gliding and hope to soar, will have a chance of hearing Herr Kronfeld speak. He is a singularly charming person, he is a real enthusiast, and he knows his job. To learn from such a man is a pleasure.

Certain Points to Note.

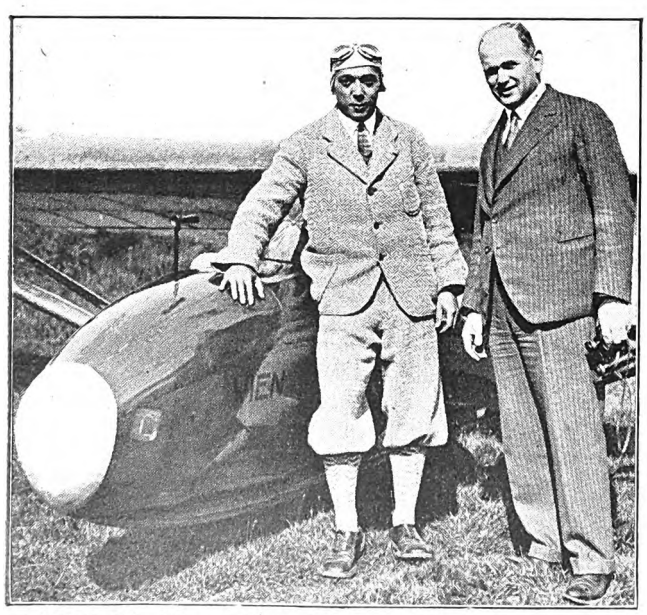
Whether this Itford Meeting will do any real good to gliding as a sport or as a science is difficult to say. People who went there knowing nothing about gliding in the first place will no doubt have been enthused by Herr Kronfeld's marvellous displays. And when they go home and are asked to admire Zoglings being pulled off the ground and flopping down again 100 yards further on they will merely be contemptuous of gliding as a sport.

The other day a sportsman wrote to this paper and wanted advice as to what he ought to charge for giving an exhibition of gliding on a machine which he had built himself. Apparently he had been asked to give such an exhibition by the people who are running the local Fête and Gala. His idea seemed to be simply that he should be pulled off a flat sports-ground by the usual catapult crews and then sit down again. One told him frankly that the best thing he could do would be to cut it out altogether, and that if he could not give a proper exhibition of soaring flight he had better leave it alone.

There is another side to the Itford show,—which is that a whole lot of youngsters who have seen the real soaring there, and think it is as easy as it looks, will hurl one another over cliffs in the same happy way that the expert soarers are hurled, and what with inexperienced pilots and badly made gliders there will be a pretty heavy death rate.

Herr Kronfeld's gliding may be compared to the performance of the juggler on the stage who holds four billiard balls between his finger-tips and then makes them vanish in the palm of his hand. It is beautifully easy when you know how to do it.

The organisers of the meeting made one fundamental mistake. That was in putting their camp where they did on Itford Hill. It ought to have been on the point of Firle Beacon. Then they would have had an area which was much easier to control, much more convenient to reach, much better for soaring with the wind as it was, and actually with a better South-Westerly face if the wind had turned the other way. Except with the wind due North or from the North-West the Itford cup is the worst of the lot.



EXPERTS.—Herr Kronfeld and Mr. Eric Gordon England, and the nose of the "Wien."

WELL FITTED.—Herr Kronfeld in his habitacle, showing how the pilot's head streamlines into the machine.

Meantime, those who regard gliding merely as an all-the-year-round form of tobogganing can get along with their game. It has nothing to do with serious soaring, and a lot of people will break their silly necks at it, as they have done in America, but it may produce a few aeroplane pilots, and so be useful to some extent.

Here let Mr. D. Bradbrooke tell the story of the first day's work.—C. G. G.

Amateurs and Artists at Firle.

The uncannily finished soaring of two great German masters, Herren Robert Kronfeld and Karli Magersuppe, was supposed to be the feature of Saturday's opening session of the gliding display at Itford, sponsored by the British Gliding Association. So, in a way, it was; but while these human gulls sailed away for hours on end and spent a quiet afternoon and evening miles away and hundreds of feet up, the real sport of the day was provided by their ambitious imitators from the various British gliding clubs. These local lights were slung off into a beautiful up-draught furnished by a nook in the Firle hills, and they teetered triumphantly above the heads of the crowd.

As one impatient aspirant remarked, waiting for a machine, the difficulty was not to get them up, but to lure them down. Their enforced nearness added to the interest.

Herr Magersuppe performed first on *The Daily Express* "Professor" type glider, which is a very pretty piece of woodwork. He made three flights of two-and-a-half hours, half-an-hour, and twenty minutes respectively. His mastery of the machine was quite astonishing, especially to those who had never previously seen any gliding, much less sail-planing; and some thousands of these were present.

One of the attractions of gliding is perhaps the essential inaccessibility of the starting-point to ordinary mortals. The summits of the Downs are not laid out with motor roads, and the traffic jam obliged many enthusiasts to leave their cars and toil up-hill for three or four miles. On the whole it was worth it.

The sight of Herr Magersuppe wheeling nonchalantly overhead and wandering for miles to-and-fro over the length of the ridge drew hundreds of pedestrians on and up.

At about 17.00 hours Herr Kronfeld was sent off in his sail-plane, *Wien*, and spent some time swooping low and talking to the various sound units as he hovered just above them. Then he started up in earnest, and was next seen about 19.00 hours when he returned from an easterly jaunt at about 1,000 ft., circled, and departed for more researches into English up-currents.

For the early afternoon the catapults were busy. Mr. C. H. Latimer Needham, one of the instructors of the London Gliding Club, took off on a Zogling and spent 22 minutes hovering over the brow of the hill. This primary training type has a rather poor gliding angle and requires a vigorous up-rush of air to keep it floating. The up-draught at this point was admirable, but limited in extent, and those aspiring soarers who got off its edge or over its crest generally ended far down the valley, where the minis-

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SIR W. G.

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trations of a Citroen-Kegresse caterpillar tractor restored them to the hill-top some time later.

Mr. Needham later took up the London Club's Prufling, and kept it up for an hour. Eventually he was reminded, per megaphone, of a luncheon appointment, and came down.

Mr. Marcus Manton's first attempt in the Prufling was not a success of the first water, as he wandered off the forced-draught, but later he achieved a fine 16-minute flight, and thereby qualified for his "C" licence. For this the pilot is required to spend five minutes *above* the level of his starting-point.

Colonel the Master of Sempill was catapulted off in a Zogling, but after a brief period of hovering drifted over the edge of the bump and continued down into the valley.

Mr. G. M. Buxton provided one of the most interesting flights of the day. Having had very limited time on gliders he has not the fine touch of Mr. Needham nor the patient cunning of Mr. Manton, but he knew where the up draft was and meant to stay within its beneficent support. Several times the glider was seen to drift too far out and begin to settle, but Mr. Buxton turned steeply and boldly back again, and repeatedly regained his height after swooping within a few feet of the ground. He landed after 16 minutes, full of action and suspense.

When we left, at about 20.00 hours, the *Wien* was still poised in the evening sky about three miles to eastward, and seemed to be about 3,000 ft. up.—F. D. B.

POST SCRIPTUM.

Reports state that late on Sunday night Mr. Lowe-Wylde completely wrote off the Kent Club's Zogling and escaped unhurt himself. He tried to turn after losing the up-current and was drifted broadside into the face of the hill.

Some good gliding was done on Monday by Herr Kronfeld and Herr Magersuppe.

THE RETURN OF THE "GRAF ZEPPELIN."

The *Graf Zeppelin* left Lakehurst, New Jersey, late in the evening of June 2 and was reported over Flores, in the Azores (as Tennyson has it), at midday on June 4. On June 5 the ship reached Seville, where it was moored in the late afternoon.

A report from the New York correspondent of *The Times* states that, according to Herr Knut Eckener, son of the famous Dr. Hugo Eckener, a regular Atlantic airship service will in all probability begin in the August of this year. Herr Knut Eckener is going to Germany to take charge of the final stages in the construction of the new Zeppelin which is nearly completed at Friedrichshafen.

The new airship will have eight engines, developing 4,000 h.p. She will carry enough fuel for 85 hours' flying at full speed.

At 07.23 hrs. on June 6 the *Graf Zeppelin* moored at Friedrichshafen after a voyage of three weeks to South and North America.

Among the passengers were Mr. Fred. M. Harpham and Mr. Karl L. Fickes.

Mr. Harpham is a Vice-President of the Goodyear Tire and Rubber Company and a Director of the Goodyear Zeppelin Corporation. He is on his way to the Goodyear factory at Wolverhampton, where he intends to spend some time. He is travelling in the *Graf Zeppelin* to Friedrichshafen, whence he will come to England.

Mr. Fickes is also of the Goodyear Zeppelin Corporation and is second-in-command of all the blimps which are operated by that organisation. He might rejoice in the title, one supposes, of Air Rear-Admiral or Air Commodore.

A MOIST END.

A *Reuter* report states that a small airship which had been used at the Stockholm exhibition and was being flown to Germany for some repairs, was forced down in the Baltic. The German crew of three were saved, but apparently the airship, or what was left of it, was not salved. Its fragments will probably give rise to another sea-serpent myth.

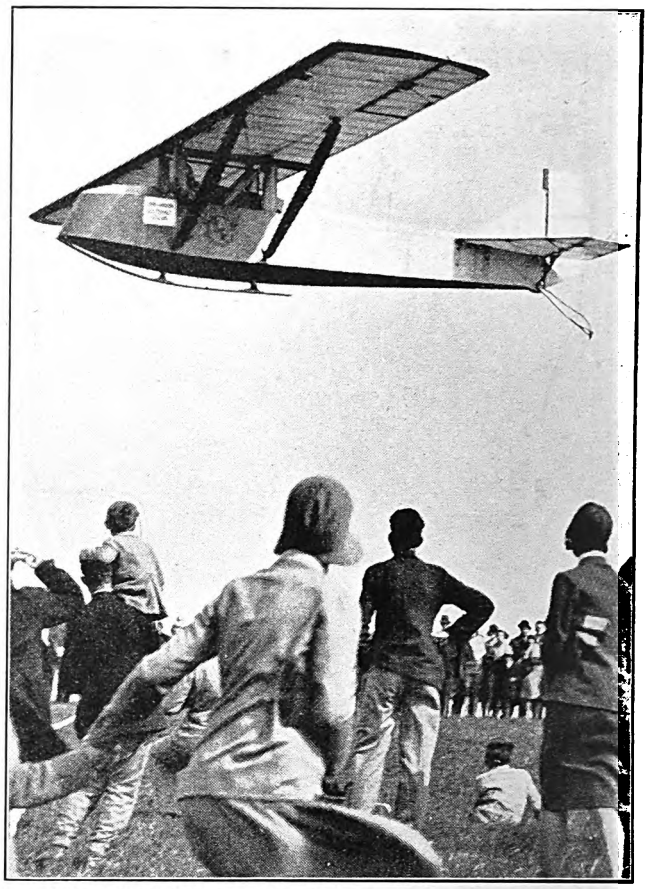
A SEAPLANE MEET AT BRIGHTON.

For June 30 and July 1, being Monday and Tuesday respectively in Brighton Gala Week, an assembly of flying-boats and seaplanes is planned. All interested owners and builders of such craft are advised to communicate with Mr. M. H. Volk, Honorary Organiser of the Aviation Section, Royal York Buildings, Brighton.

A NEW HEIGHT RECORD.

On June 4 Lieut. Apollo Soucek, U.S.N., made an attempt on the World's Height Record, and as the result of the examination of his barograph by the U.S. Bureau of Standards he is claimed to have reached a height of 43,166 ft.

The present World's Record is held by Herr Willi Neuenhofen, who, on May 26, 1929, reached a height of 41,795 ft. in a Junkers monoplane (Bristol Jupiter engine).



THE PRUFLING.—The Kegel intermediate training machine which Mr. Needham cracked up on Sunday.

A NEW AIRPORT FOR PARIS.

The French Air Minister, M. Laurent Eynac, has announced that a new Airport for Paris will be established to replace Le Bourgêt, which will be turned into a purely military air station.

No official decision has yet been made about the site of the new Airport, but consideration is to be given to Maisons-Laffitte, about 10 miles N.W. of Paris, where there is an excellent seaplane station adjoining the plain of Fromainville. In any case it is the intention of the French Air Ministry to establish a combined land and seaplane airport for Paris, and a total of £1,200,000 is to be devoted to its construction.

AN IRONY OF PEACE.

Kurt Stollwerck, who was stated to be a German war-time pilot of repute, and a member of the famous family of chocolate manufacturers, was drowned on May 31 at Long Beach, Long Island. Herr Stollwerck was flying a French Avileo machine (a high-wing monoplane) which dived into the water during a stunt flight. Apparently Herr Stollwerck was interested in the introduction of this type into America.

COKER CLARKSON.

One learns with the deepest regret that Mr. Coker F. Clarkson, Secretary of the Society of Automotive Engineers, the greatest of all the automobile organisations in the United States, died suddenly on Wednesday, June 4, at Scarborough, New York, as the result of a heart attack.

Mr. Clarkson had been Secretary of the S.A.E. for many years and thanks very largely to his outstanding ability and industry the Society occupies a position in the automobile affairs of the World which is at once powerful, influential and valuable. The published proceedings of the S.A.E. contain information which is immensely educative to all who are concerned with the technics of automobile engineering, whether for vehicles used on the land or on the sea or in the air, and Mr. Clarkson has been very largely responsible for the excellence of this information.

As a man he seemed typical of everything that is best in the States. His sound common sense and his all-round knowledge of men and affairs was balanced by an exquisite sense of humour which made him a most enjoyable companion. Personally one owes him a deep debt of gratitude for his many kindnesses and great courtesy when one was in the States. One can only hope that the Society may be so fortunate as to discover as good a man to fill his place.—C. G. G.

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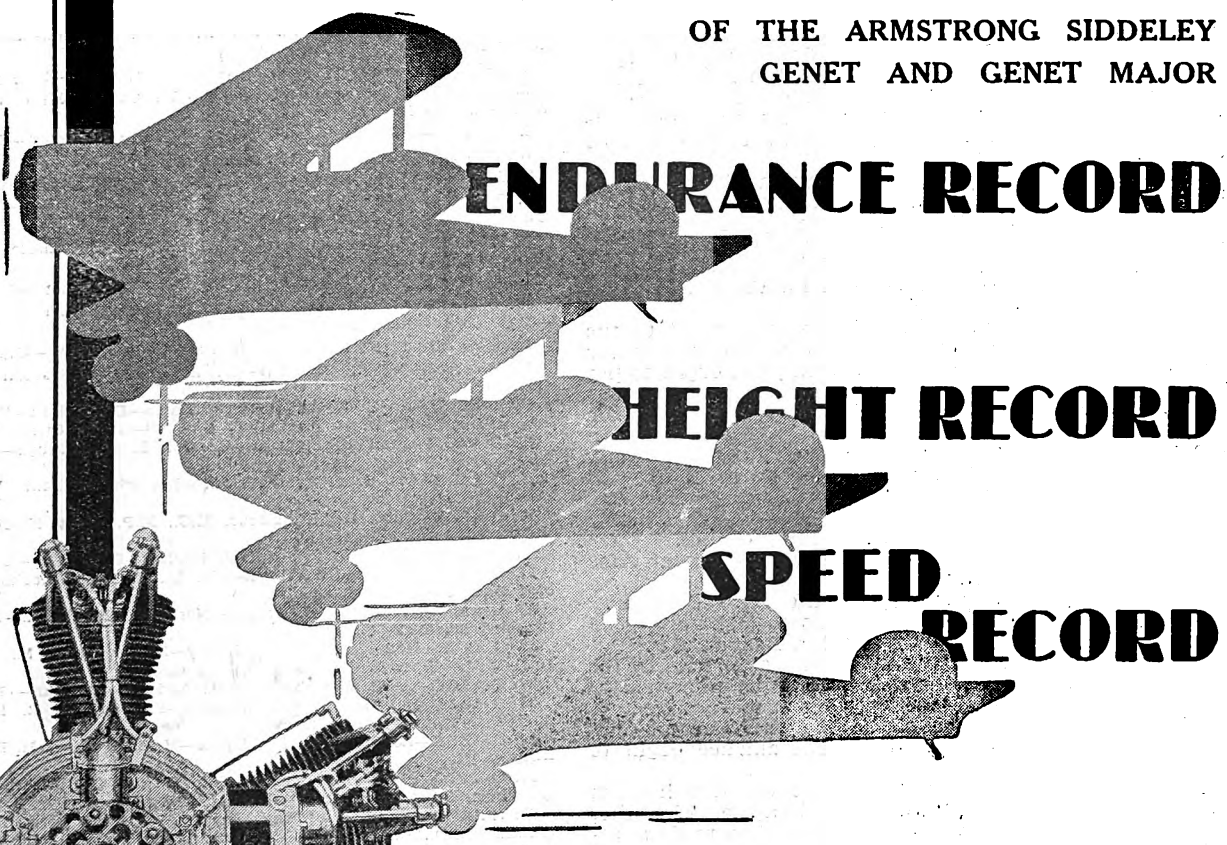
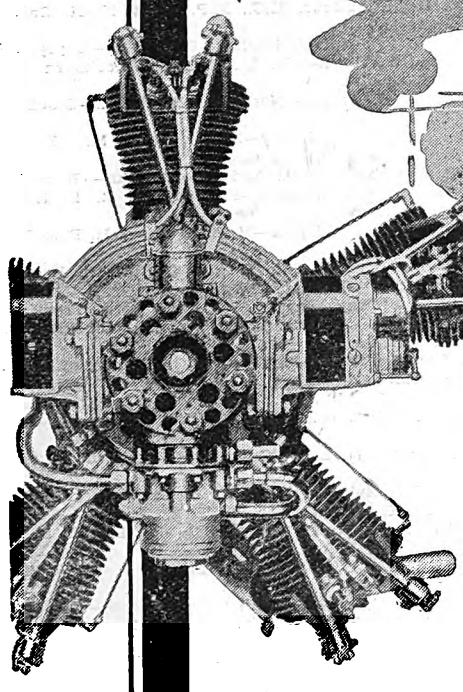
WORLD'S 4 RECORDS

OF THE ARMSTRONG SIDDELEY GENET AND GENET MAJOR





ENDURANCE. Light Aeroplanes, 3rd category, single seaters, weight 200-350 kgs. (440-770 lbs), distance in a straight line, July 17th, 1929; D. S. Zimmerly, Barling, U.S.A., N.B.3 80-88 h.p. Genet, 2,500 kms. (1,553 miles).

HEIGHT. Light aircraft, 3rd category (single seaters weighing less than 350 kgs). Altitude (France), Albert monoplane fitted with 80-88 h.p. Genet engine at Le Bourget, February 11th, 1930; 7,730 metres (25,509 ft.). Class C. First category Light Aircraft up to 400 kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 21st April, 1930, at Darmstadt; Height, 7,521 metres (24,819 ft.).

SPEED. Class C. First category Light Aircraft up to 400 kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy, with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 23rd April, 1930 at Darmstadt; 214.848 kms. (134.3 miles) per hour over 100 kms (62.5 miles).

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THE KING'S CUP RACE.

The entry list for the King's Cup Race was published, most inconveniently, on the Saturday before Bank Holiday and a truly formidable list it is. Ninety-six entries will take a good deal of starting, and so many of the machines are practically identical that they will have to be started in very large bunches.

Naturally the most important entries are those of His Royal Highness the Prince of Wales and His Royal Highness Prince George. That two Royal Princes should take this practical interest in air racing definitely puts the sport socially on a level with horse racing, and in front of motor racing,—a form of racing which has never attracted quite the best people. Moreover this year there are more genuine sporting entries than ever in proportion to the number of trade entries.

As was stated in THE AEROPLANE a fortnight ago the Prince of Wales has entered a Hawker Tom-Tit with an Armstrong Siddeley Mongoose engine, to be flown by Sq-Ldr. Don with Flt.-Lt. Heslop as navigator. There is interest in the fact that Sq.-Ldr. the Rt. Hon. F. E. Guest has secured a second Tom-Tit for the race and intends to fly in it himself.

Prince George has a paid handsome compliment to the De Havilland Company by selecting a Hawk-Moth as his entry, and Mr. E. H. Fielden, the chosen pilot, ought to put up a good show.

Sir Henry Segrave has taken a bold step in entering the Meteor for the race. Though one has complete faith in the machine as a type, the first of everything new nearly always develops some unexpected trouble, so if it gets through it will be a very fine testimonial for Saunder-Roe Ltd., who built it. And in the hands of Flt.-Lts. Atcherley and Stainforth it will certainly have every chance.

Three Desoutter Coupés in the race are a good entry for a young and energetic firm.

The new Avro Trainer, which is the Avro Company's answer to the Hawker Tom-Tit, ought to put up a good show in the hands of our old friend Mr. Bennett Baggs.

Another interesting entry is that of an Avro Five by Sir Philip Sassoon, to be piloted by Flt.-Lt. Pope who was for a long time one of the best known pilots at Martlesham.

Miss Spooner is flying one of the Southern Aircraft Co.'s Martlets, with a Gipsy II engine. The alliance ought to be worth watching.

There are two Comper Swifts in the race. One has the well-known two-cylinder A.B.C. Scorpion engine. The other with the newest type Pobjoy, may be expected to do something startling. Mr. Gerard Fane the pilot distinguished himself during the War by shooting down a Zeppelin at Yarmouth, and little has been heard of him as a pilot since then.

Lord Trenchard, who thus makes his debut in the sport of flying, has entered a Bluebird with a Hermes engine piloted by Sq. Ldr. Slatter. Sir Philip Sassoon has entered another Bluebird piloted by Mr. Gillan. Colonel Sempill is flying another Bluebird himself. Mr. Norman Holden has entered a Bluebird to be flown by Flt. Lt. Du Boulay. Sq. Ldr. Orlebar, the holder of the World's Speed Record, is flying another Bluebird. And Mr. McAlpine has entered a Bluebird to be flown by Flt. Lt. Waghorn, the Schneider Trophy winner. Truly this Bluebird party is a surprise.

An entry which is bound to excite curiosity is the big Vickers Vellore with a Jupiter XI engine entered by Sir Robert McLean to be flown by Mr. Summers. This is certainly the biggest machine in the race and as it is essentially a transport machine we ought to learn something from its performance about the possibilities of British Air transport.

An entry also to be watched is the Hendy 302 to be piloted by Mr. E. W. Percival, the well known Australian pilot. This machine has been designed by Mr. Henderson who built the Hendy Hobo at Shoreham, and it has been built at the Parnall Works at Bristol.

Other "mystery ships" are the Avro monoplanes, the Spartan Arrows, and the Arrow-Active.

The entries, classified by types are as follows:—

D.H. Moths 35; D.H. Puss Moths 10; D.H. Hawk Moth 1.
Avro Avians 8; Avro Avian Monoplanes 2; Avro V 1; Avro Trainer 1.
Bluebirds 15.
Spartans 4; Spartan Arrows 2.
Comper Swifts 2.
Desoutter Coupés 3.
Hawker Tomtits 2.
Westland Widgeons 3.
Segrave Meteor 1.
Vickers Vellore 1.
Robinson Redwing 1.
Arrow Active 1.
Hendy 302 1.
Southern Martlet 1.
A.B.C. Robin 1.

Hereafter is the complete list of competitors. First comes the racing number of the machine, according to the date of entry, next comes the registration lettering of the machine, then the name of the entrant, then the name of the pilot, then the make of machine, and last the make of engine:—

1. G-AARU—F. S. Symondson—F. S. Symondson—D.H. Moth—Gipsy.
2. G-EBYV—I. R. Parker—I. R. Parker—D. H. Moth—Cirrus II.
3. G-EBYZ—A. G. G. Marshall—A. G. G. Marshall—D.H. Moth—Gipsy I.
4. G-AAZF—Gerard Fane—G. Fane—Comper Swift—Pobjoy Type P.
5. G-EBWU—Lt. Caspar John, R.N.—Lt. Caspar John, R.N.—Avro Avian—Cirrus II.
6. G-AAWU—Arthur Stanley Preist—A. S. Preist—Moth—Gipsy I.
7. G-AAEW—Derek Schreiber—Derek Schreiber—D.H. Moth—Gipsy.
8. G-EBQW—J. B. Buckley—J. B. Buckley—Moth—Cirrus III.
9. G-AAXW—Roy Faulkner—Capt. C. D. Barnard—D.H. Puss Moth—Gipsy III.
10. G-AAXP—Andrew P. Holt—Flt. Lt. R. L. R. Atcherley—Segrave-Meteor—Gipsy IIIs.
11. G-AAYD—W. L. Hope—W. L. Hope—D.H. Puss Moth—Gipsy III.
12. G-AAGA—Lt.-Col. A. Hamilton Gault—Lt.-Col. A. Hamilton Gault—D.H. Moth—Gipsy I.
13. G-AABO—T. H. Naylor—T. H. Naylor—D.H. Moth—Gipsy I.
14. G-AAWZ—W. A. Andrews—W. A. Andrews—Spartan Arrow—Gipsy I.
15. G-EBVD—A. G. Vlasto—George Vlasto—D.H. Moth—Cirrus I.
16. G-EBOT—D. M. K. Marendaz—(—— ?)—Moth—Cirrus I.
17. G-AAGN—John C. Ballardie—Lt.-Col. L. A. Strange—Spartan—Cirrus III.
18. G-AADE—C. S. Napier—C. S. Napier—Westland Widgeon—Gipsy I.
19. G-ABBE—Capt. H. H. Balfour, M.C., M.P.—Capt. H. H. Balfour—Spartan Arrow—Gipsy II.
20. G-AAFA—M. H. Findlay—M. H. Findlay—Puss Moth—Gipsy III.
21. G-AACC—Norman Blackburn—Flt. Lt. T. Rose—Blackburn Bluebird Mark IV—Cirrus Hermes.
22. G-AABV—Norman Blackburn—Norman Blackburn—Blackburn Bluebird Mark IV—Gipsy.
23. G-AAEE—Hon. Lady M. Bailey—Hon. Lady M. Bailey—D.H. Moth—Gipsy I.
24. G-AAGO—A. E. Chambers—H. T. Andrews—Spartan—Gipsy II.
25. G-ABAJ—Sq. Ldr. H. W. Woollett—Flg. Off. H. R. L. Hood—Spartan 3-seater—Cirrus Hermes.
26. G-ABBH—Lord Wakefield of Hythe—H. S. Broad—D.H. Puss Moth—Gipsy III.
27. G-ATTO—Norman E. Holden—Flt. Lt. G. G. H. Du Boulay—Blackburn Bluebird Mark IV—Gipsy I.
28. G-AAVG—Marshal of the Royal Air Force Lord Trenchard, G.C.B., D.S.O., D.C.L., LL.D.—Sq. Ldr. L. H. Slatter—Blackburn Bluebird Mark IV—Cirrus Hermes.
29. G-AAIR—Col. The Master of Sempill—Col. The Master of Sempill—Blackburn Bluebird Mark IV—Gipsy I.
30. G-AAOI—Rt. Hon. Sir Philip Sassoon, Bart., P.C., G.B.E., C.M.G., M.P.—John W. Gillan—Blackburn Bluebird Mark IV—Cirrus Hermes.
31. G-AAUV—Loel Guinness—Loel Guinness—Blackburn Bluebird Mark IV—Gipsy I.
32. G-AATN—Robert MacAlpine—Flt. Lt. H. R. D. Waghorn—Blackburn Bluebird Mark IV—Gipsy I.
33. G-AALL—H.R.H. The Prince of Wales, K.G.—Sq. Ldr. D. S. Don—Hawker Tomtit—Mongoose III A.
34. G-ABAM—Richard R. W. R. Trafford—Richard R. W. R. Trafford—D.H. Moth—Gipsy I.
35. G-EBWT—W. L. Runciman—W. L. Runciman—Moth—Cirrus III.
36. G-AARX—Flt. Lt. N. Comper—L. S. Snaith—Comper Swift—Scorpion II.
37. G-EBRQ—J. Wellworth—J. Wellworth—Westland Widgeon III—Genet III.
38. G-EBQH—F. A. I. Muntz—(—— ?)—D.H. Moth—Gipsy I.
39. G-AAEF—A. B. Ferguson—A. B. Ferguson—D.H. Moth—Gipsy I.
40. G-AAMG—Flt. Lt. F. G. Gibbons—Flt. Lt. F. G. Gibbons—Spartan—Cirrus Hermes.
41. G-AAHJ—Capt. F. W. Ewart Morgan—S. A. Thorn—Avro Avian Mark IV M—Cirrus Hermes.
42. G-AATK—A. M. Desoutter—A. B. H. Youell—Desoutter I—Cirrus Hermes.
43. G-AASW—Sir Robert McLean—J. Summers—Vickers Vellore—Bristol Jupiter XI.
44. G-AAHP—W. L. Hope—R. O. I. Muntz—D.H. Moth—Gipsy II.
45—G-AAXT—Norman E. Holden—E. G. Hordern—D.H. Puss Moth—Gipsy II.
46. G-AAYY—J. W. P. Chalmers—J. W. P. Chalmers—D.H. Moth—Gipsy II.
47. G-AAUW—Mrs. Robert Blackburn—Flt. Lt. H. V. Rowley—Blackburn Bluebird Mark IV—Gipsy I.
48. G-AAWY—Flt. Lt. J. R. Addams—Flt. Lt. J. R. Addams—Spartan Arrow—Cirrus Hermes.
49. G-ABAE—Mrs. C. M. Young—Mrs. C. M. Young—D.H. Moth—Gipsy I.
50 G-AAUO—Capt. P. G. Robinson—(—— ?)—Robinson—"Redwing"—A.B.C. Hornet.
51. G-AAWR—C. M. Pickthorn—C. M. Pickthorn—Moth—Gipsy I.
52. G-AAKI—Richard Ince—Richard Ince—D.H. Moth—Gipsy I.
53. G-ABBA—Lord Wavertree—Flt. Lt. S. B. Allen—Moth—Gipsy I.
54. G-EBOI—P. A. Wills—P. A. Wills—D.H. Moth—Cirrus II.
55. G-EBVZ—Miss Winifred S. Brown—Miss Winifred S. Brown—Avro Avian—Cirrus III.
56. G-AALK—Sq. Ldr. The Rt. Hon. F. E. Guest—Sq. Ldr. The Rt. Hon. F. E. Guest—D.H. Moth—Gipsy I.
58. G-AADA—John D. Irving—John D. Irving—D.H. Moth—Gipsy I.
59. G-EBQN—P. N. G. Peters—Flt. Lt. Bruce—Avro Avian—Cirrus III.

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60. G-AAEL—Flt. Lt. D. V. Carnegie—Flt. Lt. D. V. Carnegie—D.H. Moth—Gipsy I.
61. G-AAPY—C. B. Wilson—P. E. S. Sayer—Desoutter I—Cirrus Hermes.
62. A. C. Thornton—Flt. Lt. J. S. Chick—Arrow Active—Cirrus Hermes.
63. G-AAVT—Mrs. D. Lawley-Gibbs—Edgar W. Percival—Hendy 302—Cirrus Hermes.
64. G-AATS—Harold John Andrews—Harold John Andrews—Blackburn Bluebird Mark IV—Gipsy I.
65. G-AAYZ—Sq. Ldr. The Hon. F. E. Guest—Miss Winifred Spooner—Martlet—Gipsy II.
66. G-EBPQ—Lieut. L. G. Richardson, R.N.—Lieut. L. G. Richardson, R.N.—D. H. Moth—Cirrus III.
67. G-EBRM—R. G. Cazalet—R. G. Cazalet—Westland Widgeon III—Cirrus Hermes.
68. G-AAZI—Rt. Hon. Lord Rothermere—C. B Wilson—Desoutter II—Gipsy III.
69. G-AAYW—Frank Hough—T. N. Stack—Avro Avian Monoplane—Cirrus Hermes.
70. G-AAKT—Roy Chadwick—J. L. N. Bennett Baggs—Avro Trainer—Mongoose III A.
71. G-AASO—Rt. Hon. Sir Philip Sasson, Bt., P.C., G.B.E., C.M.G., M.P., Flt. Lt. S. L. G. Pope—Avro V—Genet Major Is.
72. G-EBZZ—Captain R. S. Rattray—Captain R. S. Rattray—D.H. Moth—Cirrus II.
73. G-AAYG—Sq. Ldr. H. A. Whistler—Sq. Ldr. H. A. Whistler—D.H. Moth—Gipsy II.
74. G-AAUZ—H.R.H. the Prince George, K.G.—Flt. Lt. E. H. Fielden—D.H. Hawk Moth—Armstrong Siddeley Lynx VI
75. G-AASL—G. de Havilland, Jr.—G. de Havilland, Jr.—D.H. Moth—Gipsy II.
76. G-AAXG—Mrs. A. S. Butler—Mrs. A. S. Butler—D.H. Moth—Gipsy II.
77. AAXL—A. S. Butler—A. S. Butler—Puss Moth—Gipsy III.
78. G-ABAI—Capt. R. Douglas—Capt. R. Douglas—D.H. Moth—Gipsy I.
79. G-AAXO—Capt. G. de Havilland—Capt. G. de Havilland—D.H. Puss Moth—Gipsy III.
80. G-AAXZ—Lt.-Comm. Glen Kidston, R.N.—Lt -Comm. Glen Kidston, R.N.—D.H. Puss Moth—Gipsy III.
81. G-AALJ—Albert A. Nathan—A. A. Nathan—D.H. Moth—Gipsy I.
82. G-AACV—G. Goodwin—G. Goodwin—Avro Avian—Hermes I.
83. G-AABS—R. Dobson—D. S. Green—Avro Avian—Genet Major I.
84. G-AAYV—J. D. Siddeley—F. Tomkins—Avro Avian Monoplane—Genet Major I.
85. G-AAYU—A. J. A. W. Barr—J. C. Cantrill—Avro Avian—Cirrus Hermes.
86. G-AAZP—Miss D. C. Guest—Miss D. C. Guest—D.H. Puss Moth—Gipsy III.
87. G-AAJS—Capt. I. C. Maxwell—Capt. I. C. Maxwell—D.H. Moth—Gipsy I.
88. G-AAJO—G. P. Fairbairn—G. P. Fairbairn—D.H. Moth—Gipsy I.
89. G-AAUU—Harald Peake—Sq. Ldr. A. H. Orlebar—Blackburn Bluebird Mark IV—Gipsy I.
90. G-AASV—Eric Gandar-Dower—Flt. Lt. F. J. Fogarty—Blackburn Bluebird Mark IV—Gipsy I.
91. G-AAWI—Lady Wakefield—Flt. Lt. John Oliver—Avro Avian—Cirrus Hermes.
92. G-AADX—A. C. M. Jackaman—A. C. M. Jackaman—D. H. Moth—Gipsy I.
93. G-AAVF—Wm. E. Rootes—Sq. Ldr. J. W. Woodhouse—Blackburn Bluebird Mark IV—Gipsy II.
94. G-AAHI—H. N. Norman—H. N. Norman—D.H. Moth—Gipsy I.
95. G-AAID—H. A. G. Howard—A. G. Mortimer—"Robin"—A.B.C. Scorpion II.
96. (—— ?)—Lord M. A. Douglas Hamilton—Lord M. A. Douglas Hamilton—Blackburn Bluebird Mark IV—Cirrus III.

AN ECHO FROM THE NEVER-NEVER.

Particulars have now reached the office of THE AEROPLANE about the forced landing of the Ryan monoplane *City of Sydney* near the Ord River, Western Australia, last March.

Mr. D. Smith, with Mr. W. Shiers as mechanic, left Newcastle Waters, Northern Australia, for Wyndham on Saturday, March 29. They intended to attempt a 12-day flight to England.

Between Ivanhoe and Argyle Downs, near the west bank of the Ord River, the Ryan was forced down by breakage of the cam-shaft of the engine. The landing was made on hard ground with plenty of room and no damage was done. Fortunately the wireless set was intact and the pair sent messages asking for help as their food was short. A police party from Wyndham rescued them after two days in an uncomfortable situation.

Mr. Shiers was one of the two mechanics on the Vickers Vimy (two Rolls-Royce engines) in which Ross Smith (since deceased) and his brother, Keith Smith, both of whom were knighted thereafter, made the first flight from England to Australia.

WITHOUT COMMENT.

This is from *The Manchester Guardian*:—

According to some experts, the tiny Comper machine—which costs a little more than half the price of any other light aeroplane, flies a hundred miles an hour, and does forty mles to the gallon of petrol—will soon be as familiar in the sky as "baby" cars are on the roads—nearly. Yet the machine is definitely a single-seater, and, according to Mr. Brian Lewis, who is a well-known authority on light aeroplanes, *it would be the worst kind of fool-hardiness to attempt to take a passenger on even the shortest flight.*

The italics only are THE AEROPLANE'S.

AN ALLEGED LIBEL ON THE SIAMESE AIR FORCE.

Phya Chalerm Akas, the Director of the Aeronautical Department of the Siamese Army, has brought actions for libel against Phya Upakara Silpasert, the editor of the Bangkok journal *Sri Krung*, and Phra Sandad Ahsorasara, editor of the journal *Karn Muang*, in connection with a certain attempted flight from Siam to India in which a Siamese flying officer was killed.

The journals inferred that the officer concerned was killed because the Air Service used old and unairworthy machines and that parachutes were not allowed.

Phya Chalerm, in evidence taken in Bangkok on Mar. 14, said that the machine of the "Boribat" type, which was flown by Capt. Chang Natinanta with Luang Neramit (since deceased) as passenger, was built in the Government workshops at Don Muang last year. It had a B.W.M. engine imported last year. He would not say what a B.W.M. engine was or what country it came from *as these were Government secrets* (sic). [Presumably this is a B.M.W.—Bayerische Motoren Werke engine, which is known to the World at large.—ED.]

The machine was in use between 30 and 50 hours before leaving for India and no signs of trouble were evident. The accident was caused by a water-tube which was broken by excessive vibration. The witness did not notice the extent of the vibration of the machine before it left for India and he said that he could not know that a water tube was leaking.

The pilot of the machine, Capt. Chang Natinanta, corroborated the cause of the accident and added that the Air Force had plenty of parachutes. When a pilot had to fly a distance of more than 50 kms. he had to wear a parachute. Before leaving for India the petrol capacity of the machine was increased from 140 gallons to 228 gallons and he alleged that this increase of fuel tended towards the safety of the aeroplane.

The editor of the *Karn Muang* pleaded in defence that he had no intention of libelling the Siamese Air Force and the article in question appeared merely as a matter of comment on a subject of public interest. He had since apologised to the Air Force and had undertaken to make any further redress that was deemed advisable.

He further claimed that Phya Chalerm Akas had no right to get the police to bring the action as the Aeronautics Department was not a corporate body. It was not a separate department, but merely a department under the Ministry of War.

Phya Chalerm Akas said that the action was brought because the article in question suggested that the Department valued its aeroplanes more than it did the lives of its aviators. The article tended to cause the public to decrease the favour it had shown to a Department of which he was a director on behalf of the Ministries of War and Marine, of Civil Aviation and of the people of Siam.

Phya Upakara Silpasert was committed for trial in the Criminal Court and Phra Sandad Ahsorasara was granted the request to have his case sent for trial by the Higher Court.

AN EARLY ROBOT'

The truism that "neither is there anything new under the sun" is constantly breaking out in fresh and disconcerting places. We now learn that a pilotless aircraft, although not of the horrific death-dealing propensities of certain monsters lately imagined by the press, flew from Paris to Bracciano (Italy) in 1804.

Certain patriotic celebrants released a Montgolfier balloon from near Notre Dame on the occasion of the Emperor Napoleon's coronation in that year, and it stayed up long enough to be carried by the wind to a spot some distance north of Rome, where it fell into a lake.

Some dispute arose over the salvage between those who fished it out, and the Papal Secretary of State, who was then Cardinal Consalvi, and the French Government which applied for the return of their emigrant fire-bag. Negotiations dragged on for two years and were only ended by a judgment at a time when the French had occupied Rome and the then reigning Pope Pius VII was in exile. By that time nobody seemed to remember where the balloon was.

In 1904 it was unearthed from beneath a pile of old carpets in the Pontifical palace. Its silk envelope was still in good condition and is now said to have increased tenfold in value during the 100 years. Aircraft fabric in 1804 seems to have been durable stuff. It is still preserved in the Vatican, and whether its original French ownership is ever reasserted or not, an honorary C. of A. seemed to be called for as a graceful posthumous compliment to its makers.

The loss of the balloon while in the custody of His Holiness, and the place where it was ultimately found, also shows that the modern bachelor is not particularly original when he sweeps his rubbish under the carpet.

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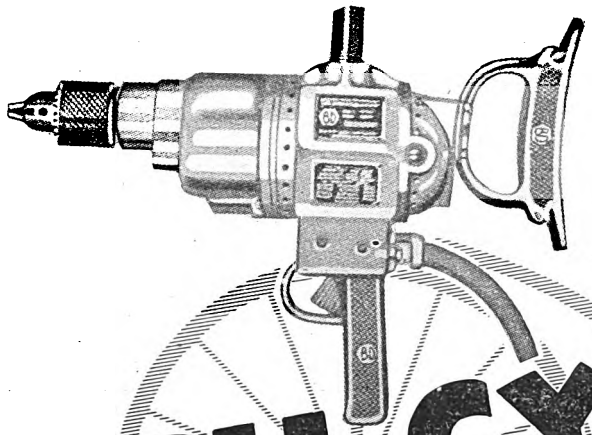

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Wing Cdr. Huntley stated that Drake was unconscious when admitted to hospital and died from laceration of the brain. He could have felt nothing. Flt. Cadet Beresford-Peirse was unable to give evidence owing to his severe injuries, which included a fractured right thigh.

A verdict of "Accidental death" was returned.

Reinforcements for the Persian Gulf.

On June 7 two Supermarine Southampton flying-boats (two Napier Lion engines each) left Mount Batten, Plymouth, to fly to Basrah to join No. 203 (Flying-Boat) Squadron, which is stationed there.

The officer personnel of the two boats are Flt. Lt. W. J. Daddo-Langlois, Flt. Lt. A. P. Revington, Flg. Off. G. Barrett and Flg. Off. F. R. Drew.

No. 203 (Flying-Boat) Squadron is commanded by Wing Cdr. T. E. B. Howe, A.F.C., R.A.F.

The R.A.F. in India.

The Times Special Correspondent in a message from Shabkadar, dated June 3, states:—

Artillery opened fire on Badshah Gul's position from a battery in a nullah near Matta Post, two miles from here, this morning. A pack battery marched out from Shabkadar Fort soon after dawn, and the first round was fired at 7.40. During the later stages of the bombardment, which lasted about half an hour, the Royal Air Force co-operated with the Army, and bombs were dropped all over the cave area.

Badshah Gul's position was easy to locate by anyone who had flown over the cave area and come back with the picture in his mind. A conical hill rising abruptly to a sharp peak stood out conspicuously with a tangled mass of large red rocks overhanging the nullah low down to the left. It was here that Badshah Gul and his *lashkar* went to ground. But if it is easy to mark them down it is not so easy to smoke them out. For weeks past the Royal Air Force has been carrying out an intensive bombardment, sometimes as many as 42 aeroplanes taking part in a raid at once. At the first sound of an aeroplane droning above, Badshah Gul's keen-eyed sentries give the alarm, whereupon the tribesmen dive down into a perfect network of underground caves, which they have enlarged with pick and shovel until they are ideal "funk holes."

To-day's bombardment had been kept a strict secret, and the first shells must have been an unpleasant surprise. In spite of a strong wind, which blew clouds of gritty sand across the plain, the firing was extraordinarily accurate, and the gunners, picking up the range from the beginning, dropped their first shells right in the mouth of the dark cleft which marks the western end of the caves. From behind our sandbags on the top of the fort we could see the sudden flash from the battery position, and then, while the Mohmand mountains were still echoing to the sound of the guns, thin columns of smoke and dust rising from the caves.

The Royal Air Force now joined the party. Aeroplanes appeared in the distant sky and the sharper crack of bombs mingled with the dull explosion of shells. About 8.15 the order to cease fire was given The column reformed on the road and made its way back to the fort.

In the House of Commons on June 6 the Secretary of State for India made the following statement:—

My latest information consists in a report from the North-West Frontier Province, dated yesterday, which showed that Afridi tribesmen in gangs of considerable size visited the villages at the mouth of the Bara Valley, within a mile or two of the cantonment at Peshawar, yesterday morning and urged the villagers to join them in an attack on the cantonment. The villagers refused, and the Afridis retired West and South-West. They endeavoured to block the roads behind them, but the obstructions have been removed. The Royal Air Force is watching the retirement of the tribesmen which is being effected in parties of varying strength ranging from 30 or so to 300 or 400 men.

There is no information yet of any military contact with the tribesmen, but a particularly threatening encampment of tribesmen in tribal territory was attacked from the air on the night of the 4th-5th.

Meteorological Information for R.A.F. Units.

A new arrangement for the supply of meteorological information to R.A.F. Units came into force on June 9 on an experimental basis for six months.

Routine weather forecasts are broadcast from the Air Ministry on a wave-length of 4,100 metres and will be issued in accordance with the details contained in an Air Ministry Order.

These forecasts include one for daylight flying, one for night flying, and one for the following day. Special weather reports and forecasts for cross-country flying are also obtainable either from the Air Ministry (Aviation Forecast Service) or from one of the meteorological stations detailed in the Order.

Special warnings are issued of the imminence of such adverse conditions as squalls, thunderstorms, gales and frosts and special warnings are issued when the wind near the ground is expected to reach gale force at a station.

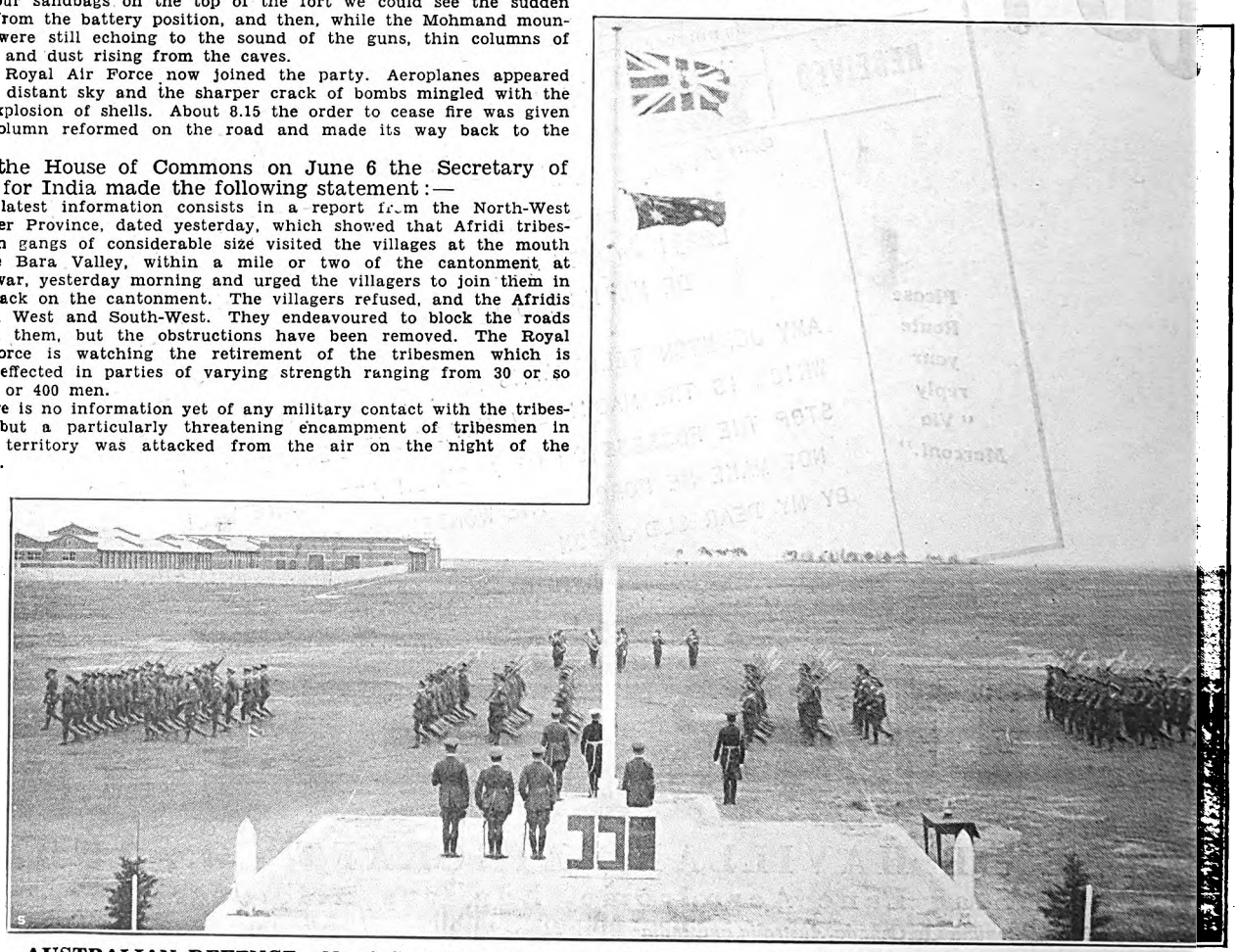
Wing Commander A. H. H. Measures.

Squadron-Leader A. H. H. Measures, O.B.E., whose retirement with the rank of Wing-Commander appears in *The London Gazette* of June 3, is one of the original little band of Royal Engineers who went to the Air Battalion on its formation and thence to the Royal Flying Corps.

He was born in 1881 at Southwell and was educated at the Southwell Grammar School. After leaving school he went into some engineering works and became in 1911 Chief Engine Tester at the Royal Aircraft Factory at Farnborough. He enlisted in the Royal Engineers in February 1912 and transferred to the Royal Flying Corps in May 1912 with the rank of Sergeant.

He learned to fly in a Maurice Farman biplane at Montrose and his Royal Aero Club certificate No. 520 is dated June 16, 1913. On the outbreak of War he held the rank of Sergeant-Major. He went to France with No. 2 Squardron, R.F.C., and in November 1914 was awarded the Military Medal. In March 1915 he was appointed Quartermaster with the honorary rank of Lieutenant.

He was restored to the Home Establishment at the end of 1916 and posted to the Aircraft Park at Farnborough. He was Mentioned in Despatches in January 1917 and again in June 1918. In March 1918 he was appointed to the honorary rank of Captain, R.F.C. In the New Year



AUSTRALIAN DEFENCE.—No. 1 Squadron, Royal Australian Air Force marching past the saluting base after receiving the Cup presented to them by H.E. the Governor-General, Lord Stonehouse, for the most efficient Unit in the R.A.A.F.

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Honours of 1919 he was awarded the O.B.E. (Military) in recognition of his distinguished services during the War.

In August 1919 he resigned his commission as a Quartermaster in the Army on appointment to a permanent commission in the R.A.F. with the rank of Wing-Commander.

In March 1920 he resigned his permanent commission as a Wing Commander at his own request to be reappointed in the rank of Squadron Leader. In June 1920 he was posted to the Headquarters Middle East for Engineering duties.

In March 1924 he was appointed to command the Engine Repair Depot in Egypt. In November 1924 he was restored to the Home Establishment and posted to the R.A.F. Depot Uxbridge. In July 1925 he was appointed to the School of Technical Training (Men) at Manston, and was in command of that Unit at the time of his retirement.

Wing-Commander Measures, whose departure from the Service will be very keenly regretted, has been flying regularly and with enthusiasm ever since 1913. That he is known by a nickname throughout the Service is evidence of the very sincere regard in which he is held.

Special Assessments.

The following officers and airmen have been awarded special assessments on completion of a course of *ab initio* flying training at No. 3 Flying Training School, R.A.F.

Special Distinctions:—Plt. Off. M. E. M. Perkins, Plt. Off. E. H. Bellairs, No. 364481 Sjt. S. C. Bastin, No. 364696 Sjt. B. J. Marsden.

Distinguished Pass:—Plt. Off. L. McHardy, Plt. Off. K. D. Knocker, Plt. Off. R. Todd, Plt. Off. P. R. May, No. 365324 Sjt. N. T. Phillips, No. 359124 Sjt. E. G. Watson.

Notations have been made accordingly in the official records.

The R.A.F. Display.

The first rehearsal of the R.A.F. Display to which representatives of the Press were admitted, was held at Hendon on June 10. As a matter of fact this should not be called a rehearsal of the Display, as it is really a demonstration of ordinary Service training. As such it was impressive. As a rehearsal it would not have made a very favourable impression on anybody. At the appointed hour three squadrons of Fighters were hidden behind the hill, but it was an hour later before two Bomber squadrons arrived, and then we heard that the Fox Squadron from Andover could not get through, as the clouds were practically on the deck. At about 13.30 hours, one and a half hours late, the five squadrons took off

A few minutes after the squadrons had taken off a flight of Fairey Foxes of No. 12 (Bomber) Squadron arrived at Hendon too late to take part in the demonstration, but in time to prove that No. 12 Squadron gets there somehow.

The three Fighter squadrons were No. 29, No. 56, and No. 111, all equipped with Armstrong Whitworth Siskins (Jaguar engine) and the Bomber squadrons were No. 35 and No. 207, both equipped with Fairey IIIFs. (Napier engine).

A strong wind was blowing from the south-west, with intermittent showers of fine rain. One was told by a Service pilot that conditions aloft were particularly unpleasant. Nevertheless the formations were quite good, particularly that of No. 29 (Fighter) Squadron. The two Bomber squadrons were divided into three units in order to manœuvre according to plan, and all the squadrons changed formation and wheeled with a precision which speaks well for this part of the Display at Hendon on June 28.

On the far side of the aerodrome the buildings for the set piece have progressed well and appear to be nearly complete. They represent the house and outbuildings of a planter, which will be, on the day of the Display, in the hands and under the flag of bloodthirsty pirates. Before the Display opens the pirates will have scuttled their ship and transported their stolen bullion overland for 40 miles (out of range of naval guns) and hidden it on the planter's estate. When we see them on June 28 they will be preparing to take the bullion to market by stolen aeroplanes piloted at the pistol's point by honest but desperate aviators. The planter is by this time swinging by his neck from a tree. The rest of the story will be told on June 28 at Hendon.—

C. M. MCA.

The R.A.F. Rifle Meeting.

The tenth annual meeting of the R.A.F. Rifle Association was held at Bisley from June 3 to June 6. The results in detail were:—

Whitelock Cup (Young Officers' and Airmen's Championship); Queen Mary conditions; h.p.s., 200 points.—1, Flg. Off. R. Harstan, Old Sarum, 159; 2, Cpl. Hancock, Andover, 156; 3, Cpl. C. Sexton, Henlow, 156; 4, AC. W. E. Lynch, Andover, 155; 5, AC. H. R. Herring, 155; 6, L-AC. Hall, Cranwell, 153; 7, L-AC. J. McLaughlin, Andover, 152; 8, L-AC. F. Penfound, Gosport, 151; 9, AC. D. Paul, Eastchurch, 150; 10, L-AC. Holloway, Calshot, 150.

Trenchard Challenge Cup.—Station rifle teams of eight; conditions as for championship; h.p.s., 1,000 points:—1, Andover, 1,182; 2, Henlow, 1,157; 3, Halton, 1,132; 4, Eastchurch, 1,131; 5, Calshot, 1,121; 6, Wittering, 1,095; 7, Gosport, 1,088; 8, Uxbridge, 1,086; 9, Felixstowe, 1,073; 10, Manston, 1048; 11, Upper Heyford, 1,043; 12, Grantham, 1,040; 13, Sealand, 1,017; 14, Martlesham, 1,003; 15, Cranwell, 991; 16, Tangmere, 978; 17, Digby, 963; 18, Netheravon, 929; 19, Old Sarum, 919.

Brooke-Popham-Steel Cup.—Squadron rifle teams of four; concurrently with Trenchard match; h.p.s., 800 points:—1, No. 12 Squadron (Andover), 584; 2, No. 502 Squadron (Aldergrove), 578; 3, No. 1 Squadron (Tangmere), 524; 4, No. 99 Squadron (Upper Hayford), 501; 5, No. 10 Squadron (Upper Hayford) and No. 33 Squadron (Eastchurch), equal, 499; 7, No. 16 Squadron (Old Sarum), 430; 8, 32 Squadron (Kenley), 424.

Command Challenge Cup.—S.R.a.; teams of eight; 10 rds. slow at 600 yds.; 10 rds. rapid at 500 yds.; 10 rds. rapid and 10 rds. snap at 300 yds.; h.p.s., 1,600 pt.; holders, Inland Area.

1, Inland Area, Cpl. C. Willott, 167; F-S. J. Burton, 166; Flt. Lt. C. W. Hill, 166; F-S. B. Crane, 152; A. C. Paul, 145; Cpl. P. Spooner, 141; F-S. A. Worden, 140; Flg. Off. R. Harston, 126—total, 1,203; 2, 'Iraq, 1,120; 3, Coastal Area, 1,111; 4, India, 1,102; 5, Middle East, 1,091; 6, Wessex Bombing Area, 1,088; 7, Halton, 1,018; 8, Fighting Area, 996; 9, Cranwell, 894; 10, Aden, 823.

Past and Present Match.—S.R.b.; teams of eight; King's second stage conditions; h.p.s., 1,200 points.

1, Past Members.—Sq. Ldr. J. L. K. Pearce, 142; Lieut. Roger Riley, 139; Cpl. E. A. Reynolds, 138; Lt. G. F. Booth, 138; Capt. E. H. Robinson (G.M.), 136; Flt. Lt. C. E. Cullen, 136; Lt. G. Richardson (S.M.), 134; Flt. Lt. A. E. Dark, 124; total, 1,087.

2. Serving Members.—AC. D. Paul, 140; Cpl. C. Sexton, 139; Cpl. C. Willott, 137; L-AC. W. Hall, 133; Flt. Lt. G. H. Stainforth, 133; F-S. A. Worden, 133; Flt. Lt. C. W. Hill, 131; Wing Cdr. A. T. Whitelock, 130; total, 1,076.

Individual Medals.—1, Sq. Ldr. J. L. K. Pearce; 2, Lt. Roger Riley; 3, Cpl. E. A. Reynolds.

Universities Inter-Squadron Match.—S.R.b.; King's 2nd Stage; h.p.s., 600 pts.

1. Oxford University.—Wing Cdr. A. G. R. Garrod, 140; C. M. Harris, 136; W. B. Thompson, 134; D. Beevers, 131; total 541.

2. Cambridge University.—E. D. Fry, 130; T. C. Worth, 126; H. St. G. Burke, 122; Wing Cdr. Vernon Brown, 121; total, 499.

J. C. Halahan Cup.—S.R.b.; King's second stage conditions; h.p.s., 150 points.—1 (after the shoot), AC. D. Paul, Eastchurch, 140; 2, Sjt. D. Edwards, Gosport, 140; 3, Flg. Off. H. H. Ellison, Aldergrove, 139; 4, Cpl. C. Sexton, Henlow, 139; 5, F-S. B. Crane, Wittering, 138; 6, Cpl. C. Willott, Eastchurch, 137; 7, F-S. F. H. Ford, Halton, 135; 8, AC. E. King, Air Ministry, 135; 9, Sq. Ldr. S. S. Benson, Andover, 134; 10, L-AC. W. Hall, Cranwell, 133; 11, Flt. Lt. G. H. Stainforth, Uxbridge, 133; 12, F-S. A. Worden, Wittering, 133; 13, Cpl. P. Spooner, Manston, 133; 14, L-AC. R. Bennett, Eastchurch, 132; 15, Group Captain L. W. B. Rees, V.C., W. Drayton, 132; 16, Flt. Lt. C. W. Hill, Henlow, 131; 17, Plt. Off. J. E. C. McClure, Netheravon, 131; 18, Sjt.-Maj. E. J. Knight, W. Drayton, 131; 19, Flt. Lt. E. R. C. Hobson, Air Ministry, 131; 20, Wing Cdr. A. T. Whitelock, Upper Heyford, 130.

The Rifle Championship.

	1st Stage	Final Stage	Agg.
1. Cpl. C. Willott, Eastchurch .. .. (Duke of Sutherland's Cup and N.R.A. and R.A.F. Silver Medals.)	168	172	340
2. Flt. Lt. C. W. Hill, Henlow	158	171	329
3. Sjt. A. Worden, Wittering	168	156	324
4. L-AC. W. Hall, Cranwell	153	166	319
5. Flt. Lt. E. R. C. Hobson, Air Min.	165	151	316
6. Sjt. J. Goude, Gosport	164	151	315
7. F-S. J. Burton, Eastchurch	162	153	315
8. Flt. Lt. G. H. Stainforth, Uxbridge	147	167	314
9. L-AC. S. T. Carpenter, Sealand ..	157	157	314
10. Sq. Ldr. T. S. Ivens, Andover ..	154	156	310
11. Flt. Lt. W. E. Staton, Calshot ..	159	147	306
12. Cpl. P. Spooner, Manston	163	142	305
13. Flg. Off. R. Harston, Old Sarum ..	159	145	304
14. F-S. B. Crane, Wittering	145	158	303
15. Cpl. W. Edmunds, Grantham ..	142	160	302
16. Cpl. G. F. Sanders, Manston ..	152	149	301
17. F-S. F. Ford, Halton	153	148	301
18. Flg. Off. E. D. Elliott, Aldergrove	149	152	301

Barton Revolver Championship Cup.—Two Whitehead practices.—1, Flt. Lt. C. W. Hill, Henlow, 199; 2, Flt. Lt. G. H. Stainforth, Uxbridge, 177; 3, F-S. A. Worden, Wittering, 176; 4, Group Captain R. J. F. Barton, Netheravon, 169; 5, Cpl. C. Willott, Eastchurch, 168; 7, Sjt. Miller, Aldergrove, 158; 8, F-S. F. Ford, Halton, 155.

Pistol Championships.—Salmond Team Cup.—1, Netheravon, 209; 2, Eastchurch, 204; 3, C. F. S., Wittering, 199. F. C. Halahan Individual Cup.—1 (after tie shoot), Cpl. C. Willott, Eastchurch, 67; 2, F-S. A. Worden, Wittering, 67; 3, Sjt. Clark, Netheravon, 59; 4, Sjt. Miller, Aldergrove, 59; 5, Flt. C. W. Hill, Henlow, 59; 6, Flt. Lt. G. H. Stainforth, Uxbridge, 58; 7, Group Captain R. J. F. Barton, Netheravon, 57; 8, Sq. Ldr. T. S. Ivens, Andover, 56.

Apprentices' Match.—S.R.b.; teams of four; 200, 300, and 500 yards; seven shots at each distance; h.p.s., 405 points.—1, B. Sqdn., No. 4 Wing, Halton, 334; 2, A Sqdn., No. 1 Wing, Halton, 325; 3, B Sqdn., No. 1 Wing, Halton, 317; 4, A Sqdn., No. 4 Wing, Halton, 305; 5, B Sqdn., No. 2 Wing, Halton, 295; 6, C Sqdn., No 1 Wing, Halton, 294; 7, C Sqdn., No. 4 Wing, Halton, 293; 8, C Sqdn., No. 2 Wing, Halton, 260; 9, Ruislip B team, 254; 10, Ruislip A team, 247; 11, A Sqdn., No. 2 Wing, Halton, 243.

The Midd'e East Dinner.

The Faithful of the Middle East—that is to say the Old Middle East Brigade of the R.A.F. and not the Muslim population of that area—held (that is the word) their annual dinner at the Connaught Rooms on June 3, with Air Vice-Marshal Sir Sefton Brancker in the Chair. Only some 75 mem-

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bers (including guests) were faithful, despite the strenuous efforts of Major Berridge, the hard-working Hon. Sec.—but perhaps next year, when Sir Geoffrey Salmond, the father of the Brigade, is home from India, more people will turn up to greet the commanding officer to whom we all owe so much.

As there were no set speeches (Thank Heaven) Sir Sefton Brancker delivered an entertaining discourse on The Middle East and things. As usual he disclaimed any credit for the work of the Brigade, which he commanded for about three months during Sir Geoffrey Salmond's absence,—though in fact he more than most people was responsible for the Middle Easters getting any machines to fly when aircraft were scarce on the Western Front. He told various very funny stories, notably one of the pre-War days when, a Minister of the Crown having claimed that the R.F.C. had over 100 aeroplanes, the whole of the Grahame-White School was bought up and flown from aerodrome to aerodrome to be counted over and over again by the emissaries of the Government's critics. (*Vide* The Aeroplane of the period.)

Several years ago Sir Geoffrey Salmond pointed out that The Middle East always provided good tips for the Derby. This year Sir Sefton drew attention to the connection of the Middle East with the Aga Khan (obviously with Ruston Pasha, and perhaps with Blenheim), and with Iliad. How many present backed the tips?

Air Commodore A. E. Borton, appealing for more support for the next dinner, told us that Major Berridge's home had been raided by the police, on suspicion of running an illicit Derby Sweep, because of the number of letters he had sent out about the dinner.

Lt.-General Sir Arthur Linden-Bell told us that he had never had keener or better people serving with and under him than the officers and men of the old Middle East Brigade.

After that the company intermingled in conversation till a late hour. One member showed that he at any rate had lost none of the quickness of action and resourcefulness which stood him in such good stead as a single-seater pilot during the War, for, at a moment when a portable fire-extinguisher had become inadvertently misplaced and lay fizzing on the stairway, he unrolled the hose on the landing above and turned the high-pressure hydrant onto it to put it out. The effect was amazing.

It was a good party, as are all Middle East parties, and old Middle Easters who could not attend this year are enjoined to make a special effort to greet Sir Geoffrey Salmond next year. Will they please get in touch now, at once, with Major F. D. Berridge, Holtside, Rowledge, Farnham, Surrey.

A Re-Union Dinner of No. 70 Squadron.

A re-union dinner of past and present officers of No. 70 (Bomber) Squadron, R.A.F., will be held at the Connaught Rooms, Great Queen Street, on Friday, June 20, at 20.00 hours.

The dinner will be of an informal nature and dinner jackets with no decorations will be worn. The cost of the dinner will be 10s. 6d., which will be collected at the dinner.

Those who wish to attend should send their names to Group Capt. H. R. Nicholl, C.B.E., Room 532, Air Ministry, not later than June 17.

AN ACCIDENT AT HENDON.

As the result of an accident to a two-seat light aeroplane near Hendon on June 7 Mr. George Ernest Villiers, Pilot Officer No. 600 (City of London) (Bomber) Squadron, Auxiliary Air Force, was killed, and Mr. Henry Winch was injured.

According to an eye-witness, the machine was approaching the aerodrome to land when it stalled at a height of about 200 ft. and dived into the ground.

Mr. George Ernest Villiers was the son of the Hon. Mrs. Ernest Villiers, of Homington House, Salisbury, and a nephew of the Viscount Wimbourne and of Sq. Ldr. the Hon. F. E. Guest, who commands No. 600 Squadron. Mr. Henry Winch is a stepson of Lady Newborough and is a lieutenant in the Scots Guards.

SWISS MILITARY AVIATION.

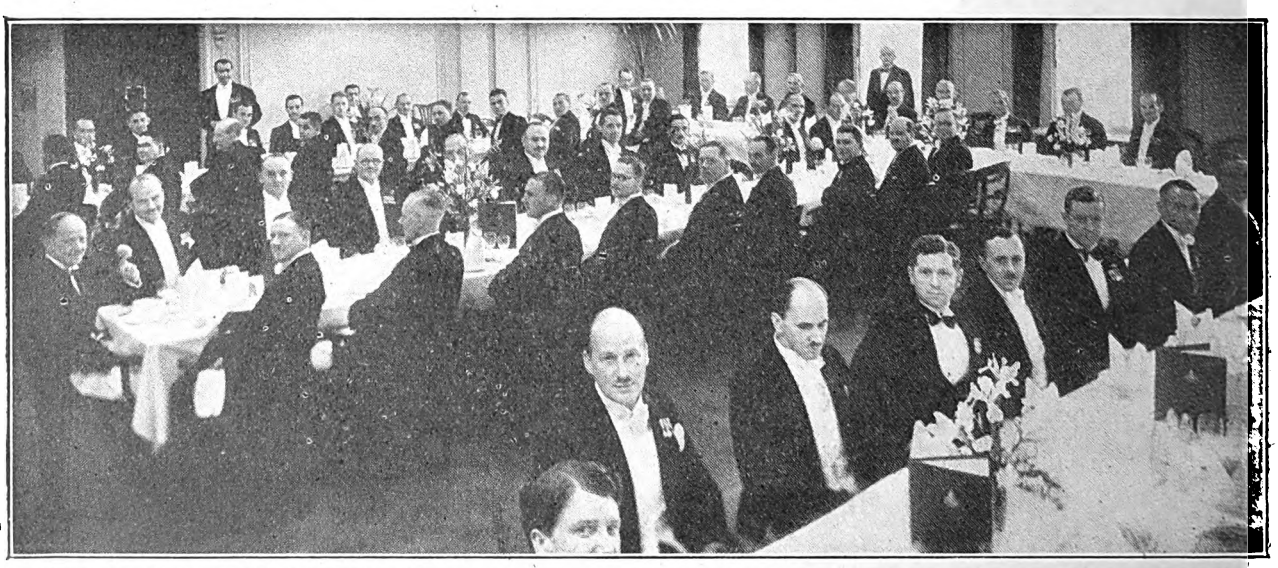
On June 4 the Swiss National Council adopted by 117 votes to 47 an allocation of 20,000,000 francs (£800,000) for military aviation. Under this allocation, the credit for which has already been passed by the Council of States, 105 new military aircraft will be bought.

A MONSTER MERGER.

The General Motors Corporation of America last year acquired a working interest in the Fokker Aircraft Corporation. Last September General Motors formed the Dornier Company of America, to make Dornier flying-boats. Now the Fokker Aircraft Corporation will be transformed into a holding company which will be known as the General Aviation Corporation. This new company will in turn take over the Dornier Company of America, and when the whole re-organisation has been done the new company will be one of the biggest in the American Aircraft Industry.

IMPORTANT DATES.

June 10—15.—F.A.I. Conference, Paris.
June 14.—Manston Garden Party.
June 14.—Royal Tournament at Olympia ends.
June 19.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gywnn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
June 30.—Flying-boat and Seaplane Assembly at Brighton.
July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).
July 9—12.—R.A.F. Athletic Championships at Uxbridge.
July 13.—N.F.S. Meeting at Leeds.
July 19.—Hanworth Garden Party.
July 20—Aug. 7.—International Touring Competition, starting from Berlin.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6.—Official opening of Mr. Lindsay Everard's private aerodrome at Ratcliffe, Leicester.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.



THE MIDDLE EAST DINNER.—The annual re-union of the R.A.F. Middle East, with Air Vice-Marshal Sir Sefton Brancker in the Chair.

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CIVIL AVIATION IN THE HOUSE OF LORDS.

In the House of Lords on June 3 Viscount Gage asked His Majesty's Government whether the route of the Indian Air Mail had been definitely settled, whether any improvements or extensions of it were contemplated and asked for information about any new or projected British services overseas. Imperial Airways had maintained a weekly service between Cairo and Karachi for over a year, but the achievements at either end of the route formed a disappointing contrast.

Germany had nearly 18,000 miles of regularly operated air route, France nearly 20,000, and the United States 46,000, while the last-named had carried in 1929 3,437 tons of mail. Our Dominions and Colonies had just under 15,000 miles, but the only link we had with any part of our Empire was this Indian route, which covered about 5,000 miles. If Imperial economic unity came to anything the question of air communications would become more important than ever. That was why he was anxious to know how this very vulnerable link of our Imperial communications was going to be safeguarded—whether by general diplomatic conventions common to a number of countries, or by private contracts and agreements with the countries over which we flew, or whether it was the intention to make modifications in the route to suit political conditions. Could he have any information in regard to the linking up of Bombay and Calcutta with Karachi?

LORD TRENCHARD said that the subject of Civil Aviation had always interested him because of its vital importance to the Empire, and not only from the point of view of defence. A great many people were continually saying: did it pay 5% on its money? That attitude was not altogether fair to Civil Aviation. Would it not be fairer to look at it from the point of view of how much it was going to benefit the Empire as a whole in securing quicker communications. Quicker communications with the Empire became more vital every year and would mean the quicker spread of civilisation. Experts would be able to go to distant parts of the Empire and assist in their development and greater markets would thus be made available. The money necessary for civil aviation was not so much a subsidy as a payment for unforeseen benefits.

The question of the freedom of the air had been debated constantly since 1919. A certain number of Powers regarded freedom of the air as signifying the right to fly over the land of any other Power. Other Powers maintained that freedom of the air was conditional on agreement with the Power whose land was flown over. He believed that at the last meeting of the Air Convention 27 Nations had voted against freedom of the air being absolute. If the aeroplanes of one Power wished to fly over the territory of another Power an agreement must first be made. That decision secured to every Power the flying rights over its own territory. Human nature being what it was he thought no other decision was practicable. He thought we had most to lose by overthrowing the decision of the Convention.

LORD THOMSON, Secretary of State for Air, said that he considered Civil Aviation as one of the most important functions of the Air Ministry and personally put it second to none. Civil aviation could not be developed to the same extent in this small island as in larger countries with less good communications. On the other hand we had a far-flung Empire which we could only reach by crossing other people's territory.

The present dispute turned on the interpretation of Article 15 of the International Convention, which no one quite understood. The interpretation put on it by the French representative was that every contracting State might make conditional on its prior authorisation the establishment of international airways and the creation and operation of regular international air navigation lines with or without landing on its territory. Great Britain had been one of the four countries which favoured a wider interpretation. When asked for an assurance that the route to India was a permanent arrangement he could only reply that its permanence would entirely depend on the local arrangements which we made with each territory that we passed over.

So far as Great Britain was concerned we had no difficulty in reaching agreement with the countries that the air line to India was now passing over. He was not in a position to go into our difficulties with Italy but from the point of view of the Government there had been no real friction of any kind although there had been a certain amount of rivalry between Imperial Airways and the company that operated the line for Italy. When we came to make a special arrangement with Italy it was rather difficult to find a basis of reciprocity because we had nothing to give Italy in return for the privileges we enjoyed on Italian territory. We had offered them various facilities which they did not require. We should have to continue to negotiate with Italy in a friendly spirit and in the meantime the existing arrangement was by no means bad.

The established route to India across the Balkans was functioning with the greatest regularity. Since Apr. 15 the whole of the route had been by air. In the winter months when there was snow on the Balkan mountains it might be necessary to resort to the train service for certain sections of the route. The loss of time would not be great.

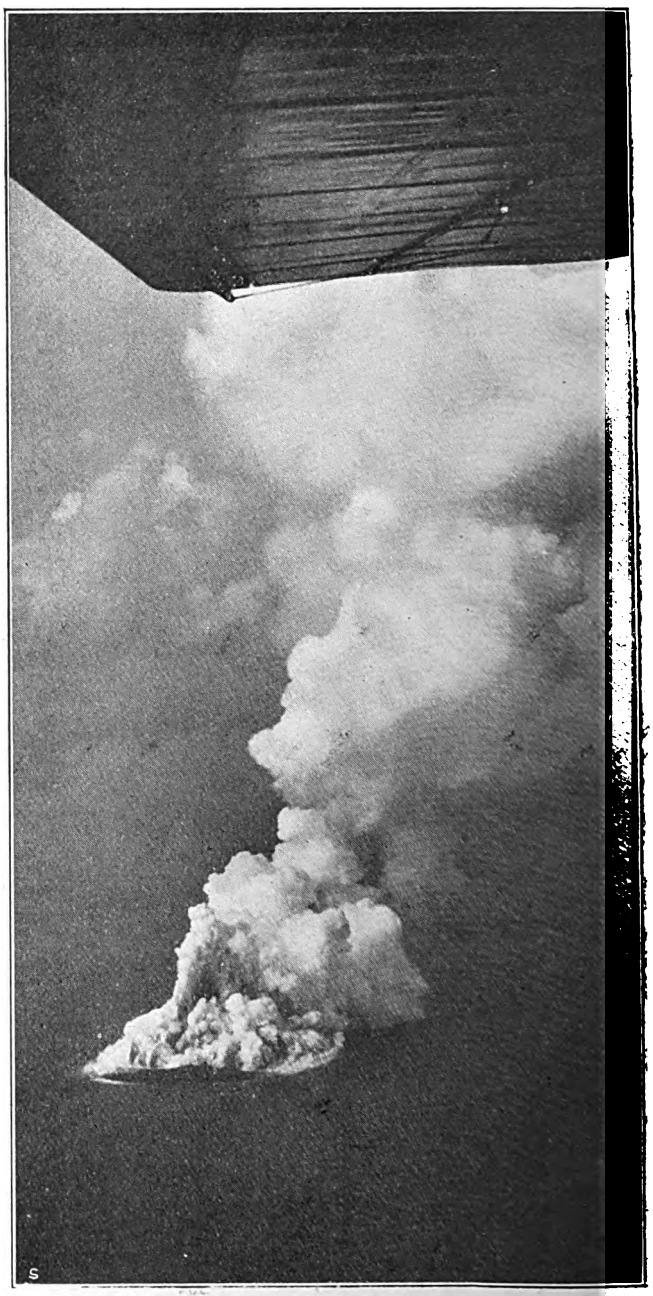
The concession from the Persian Government expired in 22 months but every effort was being made to persuade the Persian Government to come to some definite arrangement one way or another. [The other way is to cut Persia out altogether and go the other side of the Gulf.—C. G. G.]

At present, in the British Empire there was about 22,350 miles of air route in regular operation. This was the second largest mileage of air route in the world in spite of the geographical advantages of other countries. [And anyhow route mileage means nothing. What counts is the Service rendered.—C. G. G.]

The date of the extension of the air route to Australia depended on the Australian Government. The air mail was functioning as far as Delhi. From Karachi to Delhi it was under charter rates and not under the general system that was being aimed at—one overhead establishment, one great trunk route from London to Port Darwin. [One hopes that when the present disturbance in India is over and India has been brought to its senses, the Imperial Government will give a smart slap to the Indian Government—which is the cause of all those troubles and loss of life—and will run our Imperial Airway as an Imperial job.—C. G. G.]

The extension through Africa from Cairo to the Cape should be completed as far as the Great Lakes by the end of this year and to Cape Town by the spring of 1931.

If he could have dictatorial powers in the matter of subsidies he would plan Empire routes not so much from the point of view



AN ORIENTAL UPHEAVAL.—Anak Krakatau, a small island recently upheaved just off the coast of Krakatau, between Sumatra and Java, has been exploding under water lately at the rate of 60 bursts per minute. Krakatau itself blew up in 1883 and killed about 25,000 people, and made a dust cloud which drifted almost round the World. The photograph was taken a few weeks ago from a Fokker belonging to the Koninklijke Nederlands Indische Luchtvaart Maatschapij.

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of whether they were commercial propositions but with a long view to the future and with the idea of really linking up the Empire both for communication and strategical purposes. [And what about commercial routes to bring business from other countries?—C. G. G.]

In defence of the system of giving a monopoly of subsidy to one company he pointed out that if Government assistance was dissipated amongst several companies they might all go bankrupt. [And so might one,—which would be as bad.—C. G. G.]

He had figures worked out to afford a fair comparison between the value received from our sibsidy and the value received in other countries. In Germany 68 per cent. of the receipts of commercial aviation was subsidy; in France 77 per cent. of the receipts were subsidy. In Great Britain only 50 per cent. of the receipts of Imperial Airways came from subsidy.

A more searching basis of comparison was the cost per ton-mile of the machines. The cost per ton-mile, which included passengers, goods and mails, was in France 16s. 9d. paid out of subsidy, in Germany 9s. 4d. and in Great Britain only 6s. 9d.

The Air Ministry was now discussing the opening up of airways in the West Atlantic. Such developments could only be made in co-operation with the Canadian Government and there they were meeting with the most sympathetic response. A great deal of work had been done by a Consultative Committee which had been set up in July. The Committee consisted of Sir Alan Anderson representing shipping, Mr. Quirey representing railways, Mr. Nugent representing the Federation of British Industries, Sir William Brass, M.P., representing the Conservative Party, Sir Archibald Sinclair representing the Liberal Party, and Mr. Snell representing the Labour Party. In addition they had the services of Colonel O'Gorman, the well-known authority on aeronautical science. [The last-named seems to be the only member with a knowledge of Aviation.—C. G. G.]

This Committee had reported most sympathetically on the Atlantic Airways scheme and he was fairly confident now that they would be able to build up something of that sort on the far side of the Atlantic, independent of the monopoly system, and he hoped this would lead to the sale of British aircraft in South America. Contributions under the Transport Subsidy Bill would be made by the Dominions anr Colonies and would probably be £370,000 next year.

The airship programme was a scientific experiment and no lives would be sacrificed through lack of foresight and skill. It would not cease to be an experiment until the supreme tests of the airships, the one to Canada and the other to India, were completed. If the almost unthinkable happened and these airships failed on their final flights, there might be a strong movement towards scrapping all the programme, which would be heart-breaking. If the final flight proved satisfactory, it might be urged that the construction should proceed forthwith with a 7,500,000 cubic feet airship, which would be a commercial proposition.

Another policy was to invite the collaboration of the big shipping companies. If during the course of this year several flights took place over a great distance and careful records were kept of expenditure on fuel, running costs and other points, he had good reason to believe the great shipping companies would be interested, not only shipping companies at home but companies on an international basis.

It might be asked why the *Graf Zeppelin* could go round the world while our two airships spent their time mainly in their sheds. The Germans had 30 years of experience in building airships and we had not had time to produce our Dr. Eckeners. He did not think that the *Graf Zeppelin* could be compared as a structure to R.101 or even R.100. Our two airships were almost unbreakable provided they were properly navigated. [Optimist.—C. G. G.]

Describing what had been achieved he said that they had two airships, a magnificent ground organisation, and a design staff. They had spent £2,300,000 on the whole programme. The two ships together had cost £894,000 and research had cost £305,000. He believed the knowledge gained was worth the money spent.

His advisers told him that there were three conditions of safety in airship navigation; sound construction and first-rate material, which he thought we had; good navigation and well trained crews—and it was amazing how the men are taking to airship work; and good meteorological information communicated promptly and systematically, which he thought was satisfactory.

VISCOUNT BRENTFORD said that Lord Thomson had not mentioned a new industry which had arisen during the last few years—surveying by aircraft. Some 11,000 sq. miles on the Zambesi had thus been surveyed, 1,000 sq. miles in 'Iraq, some 2,500 sq. miles in India, and quite recently a survey was being made by British machines of 20,000 miles of country which could not be surveyed by any other means.

LORD THOMSON said that the noble Lord would be interested to hear that 90,000 square miles in Northern Rhodesia was being surveyed and the survey would be completed in two years.

VISCOUNT BRENTFORD said that in the export of aircraft and aircraft engines we beat all the countries in the world. He pleaded for financial support for the development of Civil Aviation.

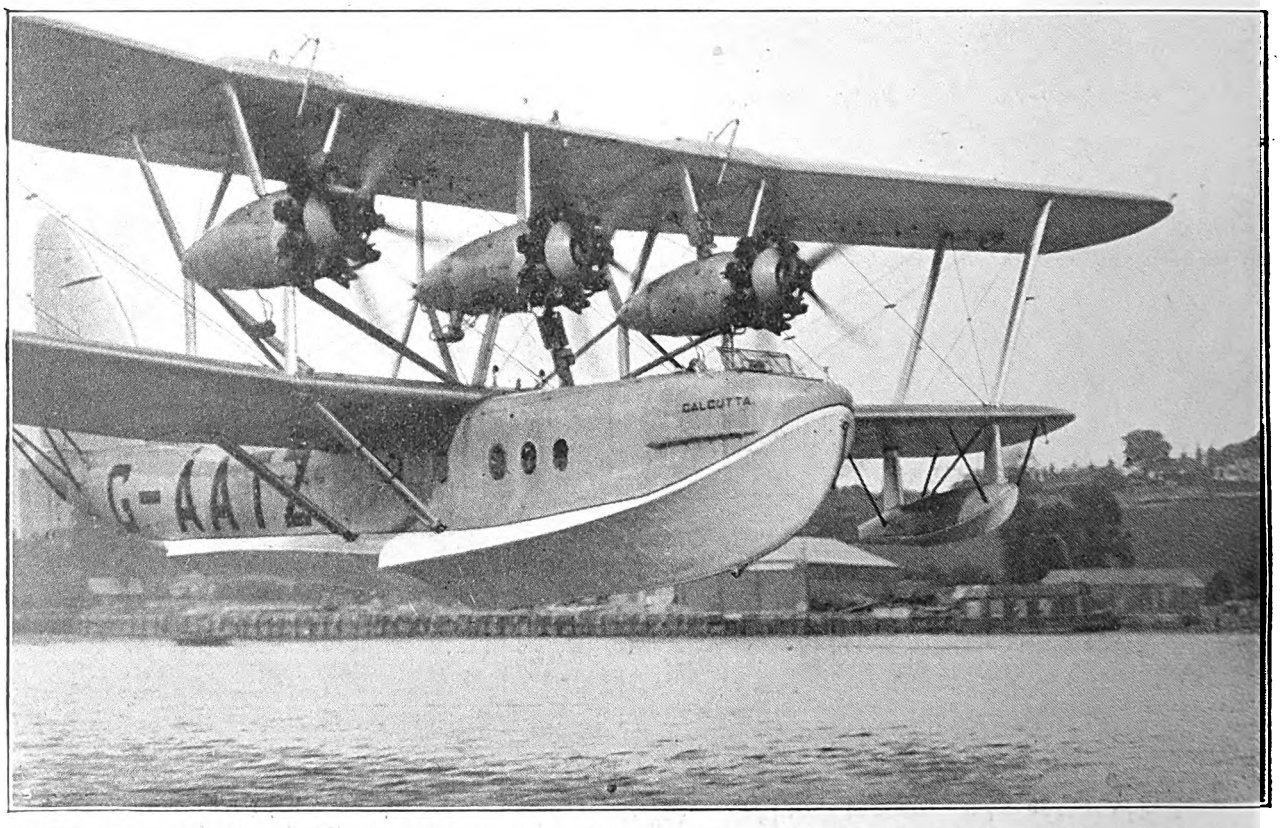
"OLD FATHER ANTIC."

[*The Law of Aviation*, by G. D. Nokes and H. P. Bridges, 240 pages (Chapman and Hall). Supplied by THE AEROPLANE Book Department, Cannon House, Pilgrim St., E.C.4, 13s. post free.]

This book is divided into two parts. The first deals with the regulation of aviation in time of peace and sets out concisely the provisions of the Air Convention of 1919 and Air Navigation Act of 1930 and Orders thereunder. It contains no new material and does not refer to the vexed question of whether the Convention of 1919 in fact confers freedom of the air on aircraft operating regular air lines.

There is no reference to the existing conditions of transport which govern carriage by all the European air companies which operate internationally; nor to the Convention of Warsaw of 1929, which presumably will shortly revolutionise the position of contractual liability of air carriers; nor to such questions as third party liability (except in relation to British Common Law and the Air Navigation Act), seizure, and combined rail and air transport, all of which are seriously exercising the minds of international lawyers (Government and otherwise) and others concerned with air transport.

The second part of the book deals with the subject of aviation in war and neutrality, and is interesting as expressing the views of the authors, but, as they say, "with few exceptions, there is no clearly defined law governing civil aviation in time of war." This, coupled with the fact that war in Europe is abnormal, makes this portion of the book of somewhat doubtful value, and the work as a whole does not carry the student beyond the limits already covered by English and American text-books.



CIVIL AVIATION ON A LORDLY SCALE.—A new Short Calcutta (Bristol Jupiters) being tested at Rochester.

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WORLD'S FLIGHT ENDURANCE RECORD BROKEN!

Major Umberto Maddalena and Lieutenant Fuasta Ceccona landed on June 2nd, at Montecelio Aerodrome, Italy, after breaking the World's Record for endurance and distance in a closed circuit, remaining aloft for 67 hours 15 minutes in their FIAT S-64 with FIAT Engines CASTROL-lubricated.
(Subject to official confirmation).

International Air Pageant and R.A.F. Display, May 30th, 1930, at the opening of the Bristol Air Port by H.R.H. Prince George.

CONTINENTAL AIR RALLYE

1st Prize: MOBILOIL Cup
2nd Prize for Long Distance

INTERNATIONAL AIR PAGEANT

BRISTOL AERIAL DERBY
2nd—Mr. E. B. W. Bartlett, D.H.60X Moth (Cirrus Mark 11)
3rd—Miss Winifred Brown, Avro Avian (Cirrus Mark 11)

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AN ARCTIC AIR ROUTE TO CANADA.

On July 3, according to *The Times* of June 4, a British expedition will set out to explore the Greenland ice-cap and determine its possibilities as part of a trans-Arctic air route to Canada. From the other end the route will probably be surveyed by the Canadian Government, which has taken a great interest in the scheme. Next year a trial trip will be made by a Vickers Vellore, and thenceforward the development of the route will be determined by Empire enterprise and commercial foresight.

The scheme grips the imagination as both revolutionary and practical; revolutionary because it proposes to link two Continents commonly accepted as being very efficiently separated by a reasonably unflyable ocean, and practical because the longest over-water stage will be the 300 miles between the Faröe Islands and Greenland.

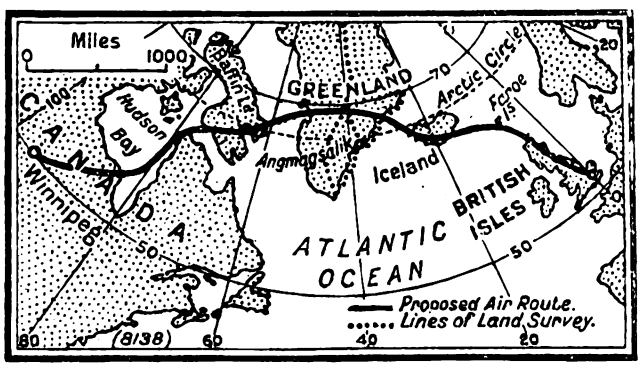
Arctic flying is in itself nothing new, and is all in the day's work for pilots of such companies as the Western Canadian Airways. The only unknown quantity is the Greenland ice-cap, which is about 500 miles wide where the proposed route crosses it between Iceland and Baffin Land. This mystery the Expedition proposes to clear up.

A base camp will be established on the south-easten coast of Greenland, and a station on the top of the ice-cap itself where meteorologists will stay for a whole year. The altitude is about 8,000 ft., and nobody has ever yet spent a winter at this height in the Arctic.

From the central base expeditions with dog teams will make journeys into the far north of Greenland, down to the south, and along both coasts and aeroplane surveys will be made. The coastal camp will be near the Eskimo inland settlement of Angmagsalik, and the plateau camp will be about 150 miles inland on the summit.

The Expedition is so far composed of the following:—

H. G. Watkins, in command; A. Courtauld, explorer and surveyor; J. M. Scott, surveyor and dog driver; Flt Lt. N. H. D'Aeth, pilot and meteorologist; Capt. P. Lemon, wireless officer; L. R. Wager, geologist; A. Stephenson, chief surveyor; J. Rymill, surveyor; F. S. Chapman, ornithologist and ski expert; Q. Riley, meteorologist; W. E. Hampton, engineer; and Lieut. M. Lindsay, surveyor. Two others, of which one will probably be a naval surgeon, are yet to be added.



Maps of the Polar Area by courtesy of "The Times."

Last year some Fellows of the Royal Geographical Society decided that the time had come to work out an aerial route to Canada over the Arctic, and referred the project to Canada. The authorities there were profoundly interested, and a Canadian Committee was formed in Ottawa which included Major-General MacBrien, President of the Aviation League of Canada.

The English Committee consists of Major Stephen Cortauld, chairman; Mr. A. G. Watkins, leader of the Expedition as well as of two previous Arctic exploration journeys; Mr. Andrew Holt; Mr. J. M. Wordie, who was a member of the Shackleton expedition of 1914-17 and has led other Arctic expeditions; Capt. Ralph Rayner, of the Royal Signals, honorary secretary of the expedition and member for Canadian liaison; and Mr. Augustine Cortauld, who has already made two expeditions to Greenland. The Prince of Wales has consented to become Honorary President of the Committee.

The Expedition is being financed by certain members of the Committee supported by a few other benefactors, including several Government departments which have lent personnel and equipment. The Royal Geographical Society has lent aid both financial and technical, and Vickers (Aviation) Ltd., have offered one of the new Vellore freight-carrier aeroplanes for the trial flight next year.

The vessel in which the Expedition will sail is Shackleton's ship, the *Quest*, and Mr. Scott is already on the west coast of Greenland making up dog teams which he will ship to the Faröe Islands to be picked up by the ship.

A Practical Route.

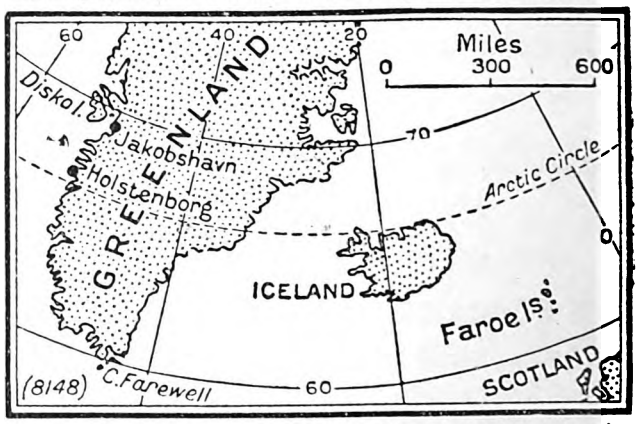
The Greenland ice-cap is one of the least known territories in the World, and the revelations from its interior will largely decide whether or no the Arctic air route to Canada can be made workable. Winter weather alone is no bar to flying, as has been proven by Admiral Byrd in trips alleged to have been made over both Poles; by Sir Hubert Wilkins in the flight in which he was piloted by the late Mr. Eielson from Alaska to Spitzbergen, in which he diverged purposely from the North Pole towards Greenland in order to see what was there; by the members of the American first Round-the-World flight in 1924; and last but not least, by Canadian commercial companies flying daily, Winter and Summer, within easy reach of the Arctic Circle and often within it.

The condition which completely stymies the last mentioned gentry is the half-melted, half-frozen state of the waters in Spring and Autumn, which prevents the use of either floats or skis. That is almost certain to be a more real problem in the establishment of a trans-Arctic route than to make it otherwise reasonably flyable and safe. The height of the ice-cap is not a great obstacle, because of the density of the air in cold regions. In Canada, hundreds of miles from the Arctic circle, the extra lift in winter air cannot be overlooked by anyone who has flown in it. The extra cold of Arctic altitudes will not matter to machines designed to fly in that sort of weather as a matter of course.

Probably fog is the real key to the Greenland situation. Polar weather has been highly commended by Sir Hubert Wilkins and others, who say that severe storms are rare. Generally, too, the air is moderately clear, and if these conditions hold on the Greenland plateau for a good proportion of the time the question of landing and refuelling points ought not to be insoluble.

The intermediate seasons in Baffin's Land and Northern Canada will be a more difficult matter, and that is where the experience of the Royal Canadian Air Force and commercial pilots who earn their living in those regions will be particularly valuable.

Winnipeg is near enough the geographical centre of North



America to be a very logical centre of traffic from the United States across the Arctic. For Western Canada itself, The Pas, 350 miles north of Winnipeg, is more likely to become the trans-Arctic aerial centre, and that town is at least a thousand miles nearer to London by the proposed air route than by any in use at present. However, the new seaport at Churchill, by the Hudson Bay Railway just finished, brings it almost as near as Montreal.

Also there is interest in noting that the sea route thus opened through Hudson's Bay is much shorter than the old one from St. John, New Brunswick, and more nearly follows the proposed air route. At present The Pas can only be reached through Winnipeg, from which city the railway journey takes some 20 hours (3½ hours by air) and a fast letter from London gets there in 15 days. If an air route reduces the time by a week or more The Pas will become the centre of Western Canada for European traffic and communications, and any growth of Empire trade, which should thus be hastened, will give a tremendous impetus to the development of Canada's rich mining areas north of the agricultural belt.

Eastern Canada wil not be brought appreciably nearer as letters cross from London to Montreal in eight or nine days.—F. D. B.

A MUNICIPAL AERODROME AT DONCASTER.

The Doncaster Town Council is about to proceed with their municipal aerodrome scheme on a site of 160 acres near the racecourse, in accord with advice given by Alan Cobham Aviation Limited.

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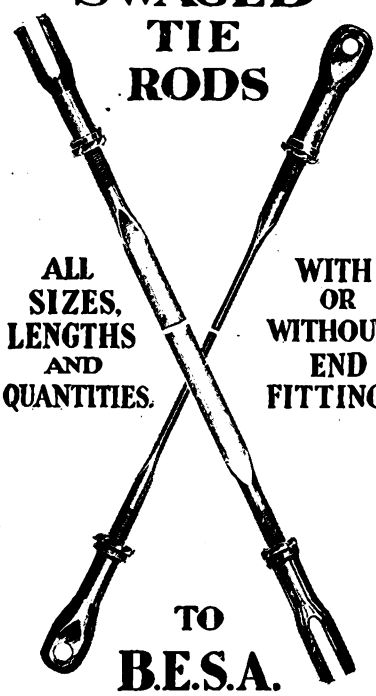

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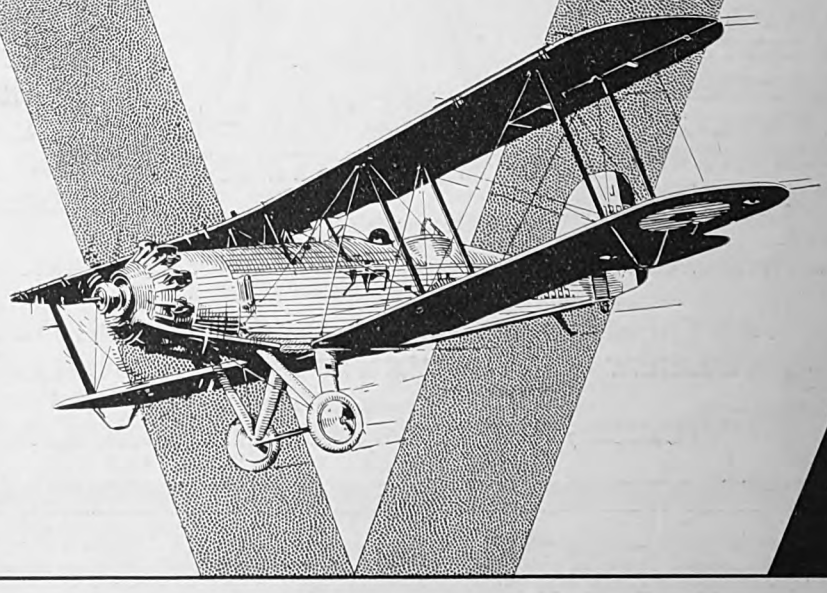

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

ARGENTINA TO ENGLAND BY AVIAN.

BY E. L. RAYSON.

ON THE WAY NORTH.—Mr. Rayson and his Avian (Hermes) filling up at Bahia.

At dawn on April 24, we set off from the polo ground at Hurlingham (Buenos Ayres) with a fair head wind and the machine loaded to 1,920 lbs.,—composed of 40 gallons of petrol, 4 spare cans of oil, numerous spares, a passenger (one Denys Hitchcock) and a fair amount of luggage.

The machine took off with very little more run than usual and we headed across the River Plate for Uruguay, arriving at the *Aéropostale* aerodrome at Pande near Montevideo, slightly behind schedule owing to the head wind. Here we re-fuelled and made for Pelotas 550 kms. away. But we put down at Jaguarao, an emergency landing ground, to clear one inlet-valve which showed signs of sticking, and then went on to Pelotas for the night.

The next day, after a stop at Porto Alegre for oil, and to meet the Vacuum Oil agent there, we headed for the coast and followed it to Florianopolis. From there the real Coast of Brazil started, a thin strip of sand backed alternatively by mountains and dense scrub. At Florianopolis we put in for petrol at a tricky little aerodrome sheltered on two sides by mountains,—which appear to be right on top of one although they do not rise until about 300 yards from the end of the field.

From here we were told to expect rain storms. And we got them! It was possible to avoid most, but on the mountainous parts round Santos and Rio we thought it wiser to fly on just above the sea rather than risk hitting a mountain.

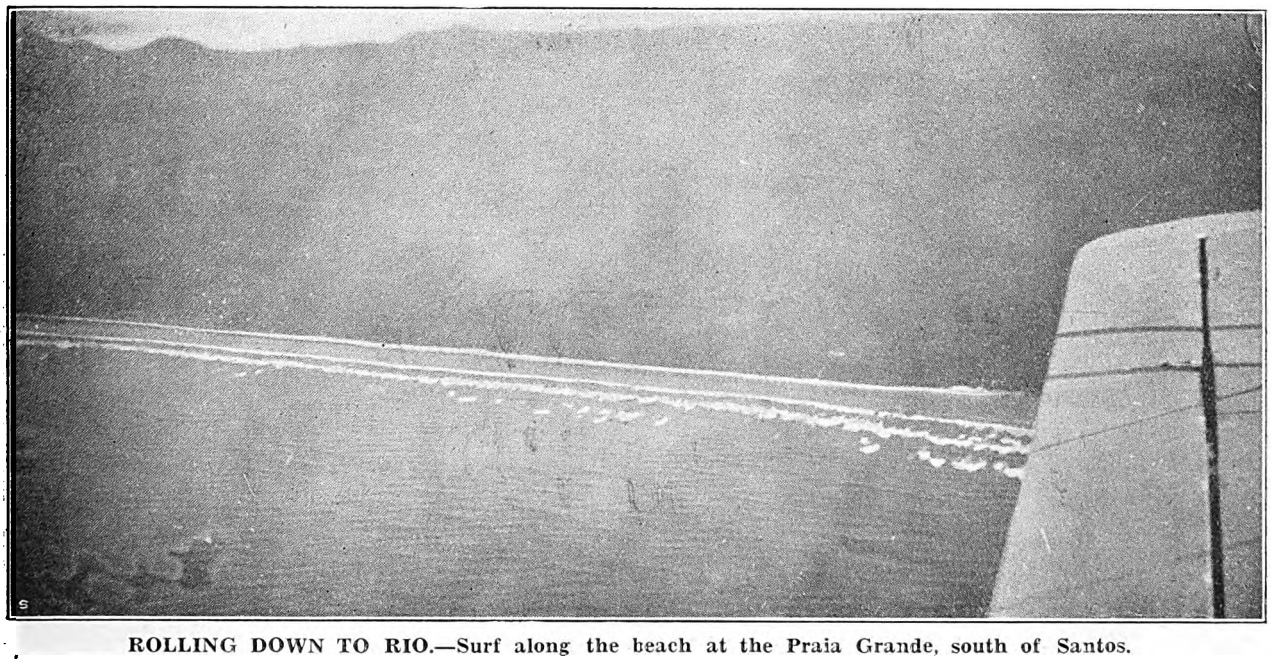
After waiting at Florianopolis for a storm to pass, we left for Paranagua where we were told there was a good piece of beach. After landing at Guaratuba by mistake and encountering considerable difficulty in obtaining anything coherent from the natives, we took off again and made Paranagua. The "town" is 50 kms. from the beach, and as we required fuel we obtained a car, arranged for us by the local agent of the *Aéropostale*, and set off up an appalling road cut straight through the marshy scrub.

At 4 a.m. next morning we returned to the machine, and after re-fuelling went on to Santos, where Hitchcock left and returned to Buenos Aires.

After paying a visit to the *S.S. Arlanza* at Santos I left for Rio. The aerodrome there was in appalling condition owing to the heavy rains. From here on I encountered storms intermittently all the way.

The next night found me at Caravellas after a stop for fuel at Victoria, where the field was completely submerged and the mail plane was delayed a day owing to the ground being too soft to get off. This did not deter the Avian, however. I attempted to get a room for the night but could find nothing which was not full of dirt and fleas, so gratefully accepted a shakedown at the aerodrome.

The last stage, to Pernambuco, was done with the same regularity the following day, stopping at Bahia and Maceió en route. At Pernambuco I found the Consul and his wife and the R.M.S.P. agents waiting for me, which was extremely



ROLLING DOWN TO RIO.—Surf along the beach at the Praia Grande, south of Santos.

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THE NORTHAMPTON MEETING.

The Northamptonshire Aero Club again had the best of luck with the weather for their Annual Pageant, which they held at Sywell Aerodrome on Whit Monday with uninterrupted sunshine and just the right amount of breeze. The crowd was so immense that it would be merely wild guesswork to estimate their numbers but the presence of sixty aircraft on a day when other flying meets were also in progress speaks volumes for Northants hospitality, and for the Club's popularity among those who fly.

Some dozen or so machines arrived on Sunday afternoon and some flew in the heats of the Sywell Grand National that day.

On Monday morning the Aerial Treasure Hunt took place. The pilots were provided with a clue which took them to a field towards Bedford which displayed a landing tee; a further clue then directed them to a tee elsewhere, and so on to a third before returning home. One visitor remarked that the clues could not have been very intellectually obscure, because none of the pilots missed them. As a matter of fact, without impugning the general intelligence of pilots, it must be said that the Treasure Hunt was pre-eminently a landing contest.

In three landings Mr. Norman Brett, of the Norfolk and Norwich Aero Club, in one of his Club's Moths, scored 0 yards, 8½ yards and 14 yards respectively from the three marks. He thus won the Northants Club Cup for the event. His closest rivals were Flt. Lt. T. Rose in his Moth (Cirrus III) KJ, and Mr. Andrews in Bluebird (Gipsy) TS, both of whom aggregated 24 yards error for three landings.

During the morning more visiting aircraft arrived, and Northampton moved en masse to Sywell by every manner of conveyance, the younger pilgrims festooned with rations for at least a day. The traffic arrangements were good, and perhaps it was rather a good idea to allow concessions to roundabouts and fair-day trimmings in the cheap enclosure, plenty far enough away from the flying so that there was no interference. Theoretically it served to amuse the youngsters who got bored. Actually, of course, the youngsters, knowing something about it, do not get bored with flying—but the roundabouts did a roaring business.

About 55 machines were present when Capt. C. D. Barnard, who arrived in a Moth (Gipsy) AL with Mrs. Barnard, opened the Pageant officially at 14.30 hours. He remarked to the microphone that a Moth was a far pleasanter mode of travel on a fine Bank Holiday than a conveyance on the roads underneath, which he could see packed with traffic all the way.

The Pageant.

A parade of aircraft opened the show with fine variety. Flt. Lt. Rose led off with an Avian Sport (Hermes), followed by Mr. A. D. Storr in the Breda 15, Mr. Morton in a Spartan (Cirrus III), Mr. Jackaman in a coupé Moth (Gipsy), Mr. John Rogers in a Klemm (Salmson), Mr. Andrews in a Bluebird (Gipsy), Mr. Penrose in a Widgeon (Cirrus III), Mr. George Murray in an S.E.5a (Hispano-Suiza), Mr. Trost in a Junkers Junior (Genet), and Mr. Wilson in a Desoutter (Hermes). There was also on the field, besides many examples of one or other of these types, Mr. W. G. Pudney's Romeo 5 (Fiat).

As the parade was landing Mr. Broad's red and silver Moth, G-AALT, came over and landed, but it was obviously not Mr. Broad's head protruding. On inquiry one was told that the pilot's name was Johnson, whereupon one winced and looked about for *The Daily Mail*. However, Mr. W. E. P. Johnson, R.A.F., although independent of any other firm of that name, admirably proved himself by his aerobatic display, deputising for Mr. Broad.

A more skilful display of inverted flying has never been seen at any flying meeting that one knows of. Mr. Johnson started by circling the aerodrome for several minutes upside down, with a great variety of turns. He dived upside down for an inverted loop, but just missed a clean follow-through at the top. He was greeted with loud and deserved applause when he landed.

A formation flight by Messrs. H. D. Davis, George Murray and G. E. Lowdell, of the Brooklands School, was very creditably done, and Mr. S. A. Thorn then ably filled in the gap made by the absence at Martlesham of the Comper Swift.

A visitor from Germany did one of the day's best turns. Herr H. Knoertzsch had flown from Stuttgart in a Klemm (Salmson) that morning with Fraulein Jung, who is also a pilot. Herr Knoertzsch is chief test pilot for the Klemm Company, and was the youngest transport pilot for Deutsch Luft Hansa. He took up his little red and white Klemm and looped it, not only in the usual way, but also without engine.

His low evolutions looked quite dangerous until one got used to the controllability of the Klemm at low speeds. The slow rolls with so small an engine were amazing. Not long after, Herr Knoertzsch and Fraulein Jung left for Stuttgart amid an enthusiastic demonstration from the ground in answer to their waving.

The comic turn represented the bombing—by accident—of a party of American tourists by Flt. Lt. Rose and Mr. T. Neville Stack. The taste of this conception might be criticised, but its execution was not unkind, except to one of the "tourists," who actually got run completely over by the car. The announcer optimistically remarked that "it didn't seem to have hurt him." Fortunately this was the case, but it was a nearer approach to a nasty incident than one has yet seen at a flying meeting.

Mr. Storr demonstrated the Breda 15 very effectively. Besides having a good top speed it certainly will fly remarkably slowly.

Further comic relief was provided by an amateur photographer who climbed into a machine to take pictures of a "famous French ace" who was approaching to fly it. It started away and got into the air. The yells of the occupant could be heard distinctly as he wallowed along the enclosure with very intermittent engine. He was heard to ask for a parachute. However, he eventually made a hair-raising landing and was identified as Mr. Lowdell.

Mr. Stack obliged with his famous aerobatic display on G-EBUF, and Mr. George Murray performed both on the S.E.5a and with inverted flying on Flt. Lt. Rose's Moth KJ.

Mr. John Tranum, who had been present at lunch time, reappeared later in the evening in a Bluebird. He had been to Reading, where he made a jump, packed his parachute and returned with Mr. Alliott in the Bluebird to jump at Sywell, which he did. Mr. Tranum and his parachute

SMILES AT SYWELL.—In the middle of this cheery group, taken at the Northamptonshire Aero Club's Pageant, are Mr. and Mrs. C. D. Barnard, the guests of honour, with Miss Slade on Mr. Barnard's left. Mr. John Tranum (in white helmet and broad smile) is holding a canned up-draught, probably intending to establish a soaring record, and Mr. Bentley has his mouth ready for the remainder of a bottled down-draught. The Linnell Brothers are on the extreme left.—(*"Aeroplane" photograph.*)

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are one of the hardest worked pairs in the Aviation Business.

The Grand Finale was rather spoiled by the sudden anti-militaristic decision of some Government Authority or other, who refused to permit the loan of troops or military material, so "friendly tribesmen" of distinctly guerilla appearance eked out what was quite an ambitious attempt at a set piece. Combined land and air attacks were made on the Kurd fort, and realistic anti-aircraft fire forced one of the machines to land. His comrade landed and rescued him from the hands of a sortie from the fort. Finally bombs set fire to the stronghold, which was abandoned, although several of the defenders were seen to return and restart the conflagration which had gone out.

Through no fault of the organisers, who did their work nobly and well, several items of the programme were altered or omitted, and that made some slight monotony and sameness in parts of it. But it was a splendid day's sport.

THE DINNER.

At the Grand Hotel, Northampton, that evening, some 200 visiting pilots and members of the Northants Aero Club gathered convivially. Capt. Barnard, replying to Mr. Chairman Newton's pledge to the Visitors, expressed the pleasure and gratitude of all his confrères at the thoroughly enjoyable show, although, he said, he had hardly expected to find himself enacting the part of even a friendly tribesman. He deprecated a suggestion in the Press that the Prime Minister deserved especial reverence for flying on his more distant concerns. Without disrespect to the Prime Minister, Mr. Barnard said, one might as well doff hats to a flea for jumping, when it would also merely be using the best available means of getting anywhere.

Flt. Lt. Rose proposed the health of the Northamptonshire Aero Club, and said that their hospitality was well known among those who had suffered it previously, and would be notorious among many more before morning. Mr. Harris replied for the Club, saying that its success was assured while the present Committees were in charge.

Mr. F. D. Bradbrooke, of THE AEROPLANE, apologised for the enforced absence of Mr. C. G. Grey, and to the Ladies, whose health he had unworthily to propose. He promised that his demeanour should be marked by the meekness, modesty, and brevity for which THE AEROPLANE was so justly famous.

Mrs. Barnard replied in a graceful speech, and thanked the hosts of the evening for their hospitality and kindness. She then presented the many cups won during the year.

Miss Molly Olney had earned the Anonymous Cup for the first lady of the Club to fly solo, and Miss Tzack got the one presented by Lord Wakefield of Hythe for the first lady to gain her "A" licence. Mr. Norman Brett received the Club cup for the Aerial Treasure Hunt; and in the absence of Mr. Johnson, who was adjudged winner of the splendid cup for the best individual effort of the 1930 Pageant, Mr. Ronald Malcolm of the De Havilland Aircraft Company Ltd. took charge of it amid cheers.

The party then dispersed to reassemble elsewhere for dancing and other divertisement until the early hours.—F. D. B.

HERR KRONFELD IN SEARCH OF UP-CURRENTS.

On May 29 Herr Robert Kronfeld, sailplane pilot *par excellence,* made a prospecting tour of the Down Country in a Blackburn Bluebird belonging to Auto Auctions, Ltd. His pilot was Mr. R. M. Windsor.

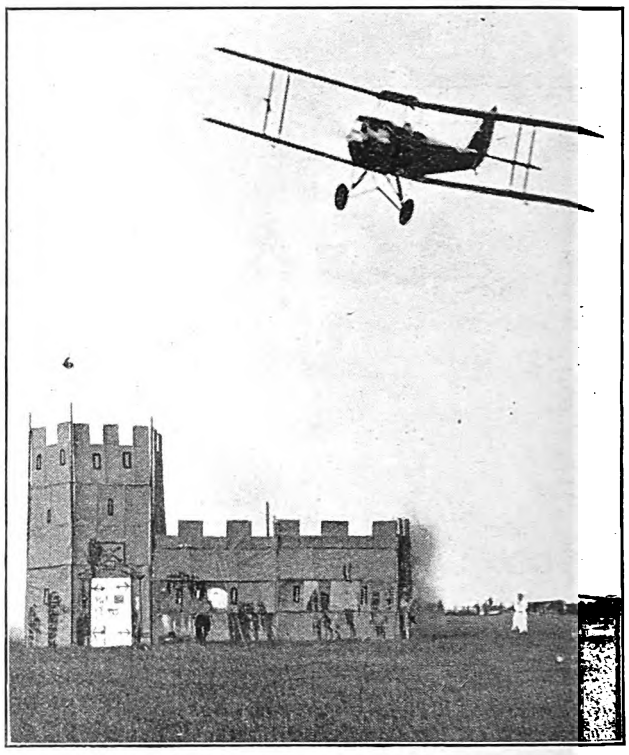
Mr. Windsor states that Herr Kronfeld is very much at home in a motor driven aeroplane, and gave some very interesting exhibitons of what the Bluebird could be made to do by one who has made a study of air currents. This was in the course of tests at various localities where the topography looked promising for his particular art.

From Heston the Bluebird was flown over the Chiltern Hills, Ivinghoe, Halton and Princes Risborough, then to Guildford and the Hog's Back. Herr Kronfeld considered the thickly wooded country about the Hog's Back unsuitable for instructional gliding, but said that one could easily travel from one end of it to the other with a suitable wind.

The South Downs proved to be the most interesting country. The hills at Lavington, Watham, Kithurst, and the high ground north of Brighton were all suitable, but Herr Kronfeld's final preference was for Glynde Hill at Lewes, and Firle Beacon at Seaford.

After refuelling at Lympne Mr. Windsor and his guest made a reconnaissance of the North Downs by Charing, Maidstone and Wrotham, but the same conditions as in the Hog's Back country exist in this district, so the verdict was unfavourable.

On his return to Heston Herr Kronfeld expressed his satisfaction with the Bluebird, especially for a tour of this nature when conference between the two occupants of the machine was practically continuous. About 350 miles had been covered in four hours.



THE WAY WITH KURDS.—A Gipsy Moth bombing the Kurd fort "north-east of Sywell" which caught fire—with a little Kurdish help—and burned to the ground.—(*"Aeroplane" photograph.*)

THE THUNDER BIRD.—Mr. George Murray doing 160 m.p.h. past the enclosures after a dive on the S.E.5a.
—(*"Aeroplane" photograph.*)

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AGA KHAN'S £500 PRIZE

for first England-India flight by a native of India

Mr. A. M. Engineer, flying a "Gypsy" Moth, has won the Aga Khan's £500 prize for the first solo flight from England to India by an Indian subject. He left Croydon on April 25th and reached Karachi on May 11th. Mr. Engineer used "Triple Shell" oil as far as Catania and "Golden Shell" oil for the remainder of the journey, throughout which he used "Shell" Aviation Spirit.

NEAREST COMPETITOR ALSO USED SHELL PRODUCTS.

Another entrant for the prize, Mr. J. R. D. Tata, also flying a "Gypsy" Moth, reached Croydon on May 12th, just missing the prize by a day. Mr. Tata used "Summer Shell" petrol and "Golden Shell" oil.

GOLDEN SHELL OIL & SHELL AVIATION SPIRIT

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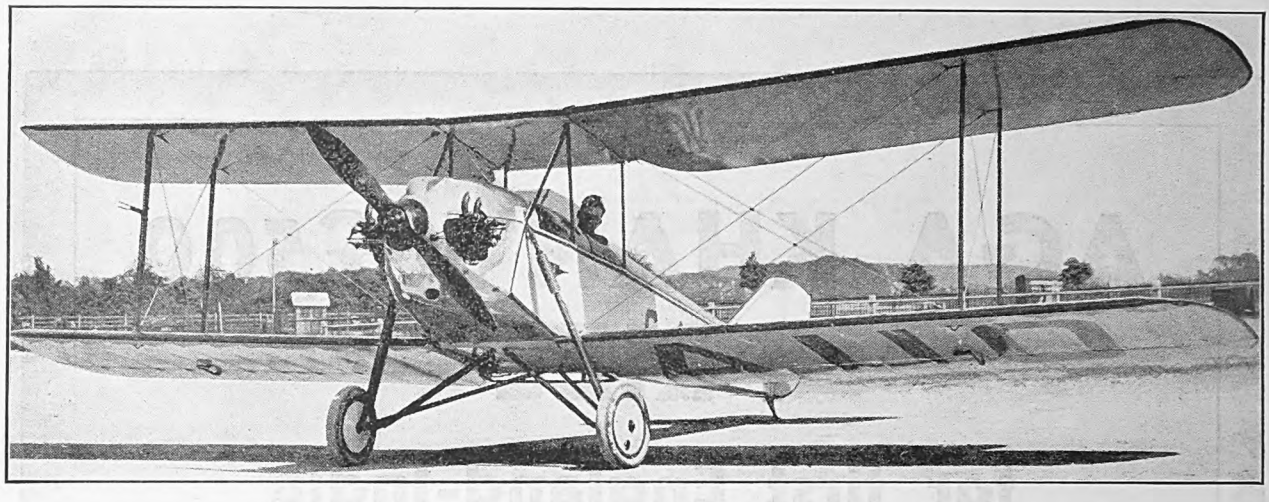

THE SIDE-BY-SIDE FASHION.—The Robinson Redwing (A.B.C. Hornet, 80 h.p.) just produced by the Robinson Aircraft Co. Ltd., of Croydon Aerodrome. The makers claim that with the side-by-side seating and double-opposed horizontal four-cylinder engine they get excellent visibility, and a good streamline to the fuselage above and below to make up for what the side-by-side position loses laterally. With its low power the machine is not claimed to be fast, but pilots say it is delightful to handle, can be landed on a handkerchief and is not at all slow.

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Royal Air Force Display

HENDON AERODROME

Saturday——June 28th

Gates Open 10 a.m. *Flying from noon to 6 p.m.*

The Display is designed to afford an opportunity to the public to witness the progress and efficiency of the Royal Air Force in a series of Service exercises that hold the sustained interest of spectators from first to last. Nearly 200 aeroplanes will take part.

PROGRAMME:

Air attack on a Pirate stronghold, involving its destruction by fire. Parade of new and experimental aircraft. Individual combats in the air. Crazy flying. Air races. Squadron aerobatics. Parachute dropping. Inverted flying and other spectacular events.

Booking now proceeding at Messrs. Keith Prowse and other Agencies.

ENCLOSURES, Tickets 10/- and 5/-. RESERVED SEATS in Grandstands, 3/- and 2/6 extra.
Car tickets (including chauffeur), 10/- and 5/-. 2/- tickets at Aerodrome on day of Display.

WORLD'S GREATEST AIR PAGEANT

Accommodation for 150,000 spectators and 15,000 cars.

ANNOUNCEMENT ANNOUNCEMENT

THE

CATERPILLAR AIR CHUTE!

A NEW PARACHUTE FOR

PRIVATE OWNERS

AND ALL

CIVILIAN AIRMEN.

(1) Same high-class workmanship and efficiency as in Standard Irvin Air Chutes.
(2) Slower rate of descent.
(3) All silk parachute.

£60

IRVING AIR CHUTE OF GT. BRITAIN, LTD., LETCHWORTH, HERTS.

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THE NORWICH OBSERVATION CONTEST.

In spite of the small field of nine starters the Cross-Country Observation Competition held on May 24 by the Norfolk and Norwich Aero Club was a decided success. What is more, it broke the ground and paved the way for imitations and developments of the same excellent idea behind the contest.

H. A. Pank, of the Norfolk and Norwich Club, who won Lord Wakefield's Cup for the event with 80 points out of a possible 120, says that he has not made so interesting or profitable a flight since the War—which is easy to believe. Mr. C. C. White was second with 30 points and thus won the Club Tankard. Mr. G. F. Surtees was third with 25 points.

The competition, as previously explained in THE AEROPLANE, consisted partly of dropping message bags at six points indicated on the map supplied to each competitor. A zero hour, arrived at by calculating on a certain air speed, was fixed for each point, and deductions were made for deviation from the appointed moment for dropping the message. Ground signs had to be indicated on the map, with marks for pin-pointing them accurately. Mr. Pank was only once more than 2 minutes either way from zero time at any point.

With characteristic sportsmanship the officials have sent to THE AEROPLANE a memorandum for the information and guidance of any who wish to put on a similar competition. It includes useful tips and warnings of certain probable difficulties.

To comply with the regulation against dropping things from aircraft (other than finely divided sand or water) special permission was got from the Secretary of State in advance. Proper message bags had been promised by the Aviation Section of the Automobile Association, but at the last moment the committee was advised that the loan of these bags for dropping anywhere but on authorised A.A. boxes was not contemplated in their agreement with the Air Ministry, and only the special permission so thoughtfully obtained saved the situation,—a point worth noting.

Two marshals were stationed at each point to record the time each message was dropped, and pilots were warned that bags dropped in the water not only entailed loss of marks but also liability for the price of said bag: four shillings.

At the supper-dance which followed the contest the cups were presented and duly filled for general consumption by the winners.

THE READING MEETING.

The Berks, Bucks and Oxon Aero Club, otherwise National Flying Services Ltd., held a successful flying meeting on Whit-Monday. The programme included two or three events for open competition besides demonstrations by N.F.S. pilots.

The feature of the day was a race to Hanworth and back, in which six machines took part: Lady Bailey, flying her Moth (Gipsy) EE, in which she had just arrived from a visit to the Northampton Pageant; Mr. H. R. A. Edwards, in the Avro Baby (Cirrus I), Lt. Col. Louis Strange, in a Spartan (Hermes); Mr. J. S. Tanner, in the Glenny and Henderson Gadfly (A.B.C. Scorpion); Mr. H. J. V. Ashworth, in an Avian (Cirrus II), and Mr. E. J. Hordern, in a Bluebird (Gipsy).

Mr. Edwards won with the creditable average of 84 m.p.h. over the 45-mile course, with Col. Strange second and Lady Bailey third, both with an average of 90 m.p.h. A pilot who knew the course rather well said that the competitors must have wandered rather, and did not make the best possible times.

Col. Strange won the Arrival Competition by landing at one second after 12.00 hours.

Aerobatics were performed by Mr. M. Bainbridge, an "A" licence pilot of the Berks, Bucks and Oxon Club. Mr. Blake, of the Blackburn Aeroplane and Motor Company Ltd., demonstrated the Lincock (Armstrong Siddeley Lynx). This fine little machine caused a real sensation with its speed and lightning-like response to its controls.

The formation flight was made up of Messrs. J. B. Wilson (manager and instructor to the Club), Cubitt (assistant instructor) and M. Bainbridge.

Mr. Tranum came from Northampton in a Bluebird, piloted by Mr. Alliott, and did a parachute drop. Some delay was caused as he was leaving the machine by his catching part of the parachute harness on the door-handle Mr. Alliott circled while he freed it, and Mr. Tranum arrived in the middle of the field as usual. He then flew back to Northampton, where he had promised to drop in at Sywell, and did.

At the end of the programme Sir Leslie Wilson, who was for many years M.P. for Reading, and subsequently Governor of Bombay, and who has recently consented to accept the presidency of the Berks, Bucks and Oxon Aero Club, presented the trophies.

MISS AMY JOHNSON.

On June 4 Miss Amy Johnson flew from Brisbane to Sydney in an Australian National Airways Fokker liner. Her Moth, in which her medical adviser had forbidden her to fly solo at present, was brought down for her by Capt. Brain.

A flight of women pilots had made arrangements to escort the liner, but at first they found, escorted and landed with the regular plane of the day and had to take off again to look for the special in which Miss Johnson was flying. On the way down to Sydney she took over the controls for a while, much to her interest as it was the first plane that she had ever flown in that was larger than a two-seater.

At Sydney a crowd estimated at 80,000 was present to greet the girl, who was driven round the aerodrome in a decorated Air Force lorry. Attorney-General Boyce, on behalf of the Government of New South Wales, welcomed her officially.

While in Sydney Miss Johnson is the guest of Sir Philip Game, Governor of New South Wales. She has received gifts bewildering in their number and variety from admirers all over the World, and they range from a New Testament to a new Puss Moth which the De Havilland Aircraft Ltd. has offered to her.

AN EMBARRAS DE RICHESSE.

As a recognition of Miss Johnson's flight, the De Havilland Aircraft Company Ltd, makers of her Gipsy Moth *Jason*, cabled offering her a new Puss Moth. In her cabled reply she says:—

> Many thanks for Puss Moth which is the machine I have most desired to possess. The possession of a super aeroplane will not make me forget the wonderful service given by my dear old Jason.

The machine will be ready for her directly she returns. As *The Daily Mail* has bought *Jason* from her and presented it to her, and as *The Daily Sketch* has opened a subscription fund to buy her yet another machine, presumably Miss Johnson will be able to fly in formation with herself when she comes home.

A SATISFYING DOSE.

[*Amy Johnson, Lone Girl Flier*. By Charles Dixon. 151 pages; 16 illustrations. From THE AEROPLANE Book Dept., 3s. 9d. Post Free.]

Of course it had to be done, and anybody who has not heard too much already and really wants to know more about the lone girl flier will find a whole heap more in this book. Of course much of it is nonsense and a great deal more of it is sheer padding. And there are lots of inaccuracies.

For example, Mr. Bert Hinkler, who was made an honorary Squadron Leader, R.A.A.F., as a reward for his 16-day flight to Australia, was never a Captain of any kind though he is given that rank in the book. Mr. R. R. Bentley, who has flown the Cape and back route oftener than anybody else, has also never been a Captain of anything. Somehow or another every slip-shod journalist promotes every aviator to the rank of Captain as soon as he takes to flying for hire or reward—it saves so much trouble looking up antique Air Force lists to find what rank a man really held. And it can always be justified by saying that he is the captain of his ship, presumably just as the skipper of the mud barge on the Thames is called Captain by his friends in the local pub. There are even commercial pilots who insist on being called "Major" though no Air Force List records their ever having held such rank. No wonder the best people refuse to use their retired rank.

Also, "Colonel Lindbergh" did not accomplish what Mr. Dixon is pleased to call an "epic dash" across the Atlantic, whatever an epic dash may be. He was made a Colonel after his return to America.

Most of the book is composed of the story of the flight elaborated by what is generally called fine writing. In a minor way it is the same sort of thing as those histories which have become so popular of late, in which the barest skeleton of history is elaborated into a narrative by sheer imagination of detail without distorting facts.

Mr. Dixon delivers himself of one statement which is quite entertaining. He says "it is true to say that if journalists genuinely admire a hero or heroine, then he or she is the genuine thing." But in these days when journalists write with the tongue in the cheek just as effectively as they do when they are writing sincerely, who is to tell whom the journalists genuinely admire? The only certainty is that the journalist leaves alone anybody whom he cordially dislikes. Which is a blessing for some people.

On the whole the book really is rather a clever effort in the way of animating a skeleton. The best stuff in it actually is the illustrations of places on the route taken by the Air Survey Company and by the Royal Australian Air Force. Also, in its way it is a good advertisement for those excellent products, the De Havilland Gipsy-Moth and the Irvin Parachute.—C. G. G.

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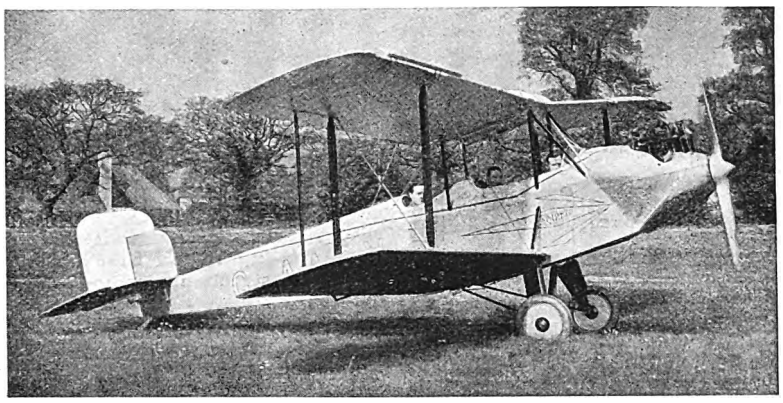
SPARTANS are robust . .



SPARTAN 3-SEATER
(Cirrus-Hermes Engine.)

SPARTAN AIRCRAFT LTD.
WESTON, SOUTHAMPTON

THAT Spartan Aircraft are robust and sound in their construction is amply proved by the high aerobatic certificate of airworthiness—1,680 lbs.—Spartans are strengthened at every point where failure has been known to occur in other light aircraft.
Therefore, Spartans are specially suitable for club work, for joy-riding and for the private owner. The flying controls are well-balanced . . . . the landing-run and take-off are short . . . . Spartans are easy to handle in aerodromes of restricted area.
The Spartan two-seater or the three-seater light biplanes are inexpensive to purchase . . . . economical to operate.
Buy . . . . and fly . . . . a "SPARTAN" . . . . with confidence.

Aeromarine.

Handley Page Ltd.

AUTOMATIC SLOT CONTROL

February, 1930.

"The Safe Aircraft Competition has indicated also the practicability of the Handley Page slot in combination with rear flap, and constructors will sooner or later come to the employment of this device."

Professor Alexander Klemin,
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COMMERCIAL AERONAUTICS.

AIR MAIL SERVICES.

At the first technical session of the Imperial Press Conference, which opened on June 6 at Grosvenor House, the Postmaster-General, Mr. H. B. Lees-Smith, touched on the matter of air mail during his address.

In reply to a criticism that little increase in speed had been achieved in the last 20 years, the Postmaster-General said that the cost of such increase would have been quite out of economic proportion until certain developments in other lines had come about, namely, in aviation. [This is sheer nonsense. Speed could be increased by 50% and the time to India halved by proper organisation, energetic official backing, and the use of existing aircraft.—C. G. G.]

The only Imperial Air Mail was that between Croydon and Karachi, which had a very creditable year's work behind it and was developing slightly in excess of advance calculations. A regular service to Central Africa would come into operation in the Autumn and it was hoped to extend it to the Cape before long, just as an additional service from Karachi to Australia was not far distant.

A NEW IMPERIAL AIRWAYS VENTURE.

On June 16 Imperial Airways is inaugurating an inland air service between Liverpool and London to connect with the company's Continental air services at Croydon.

The service will operate three times weekly in each direction. On Tuesdays, Thursdays and Saturdays a machine will leave Liverpool at 07.00 hrs., Manchester at 07.25 hrs., and Birmingham at 08.20 hrs. On Mondays, Wednesdays and Fridays a machine will leave Croydon at 17.50 hrs. and will reach Birmingham at 18.35 hrs., Manchester at 19.30 hrs. and Liverpool at 19.55 hrs. The type of machine to be used will be the sixteen-passenger Handley Page W.8.

The fares will be: Liverpool-Croydon, £3; Manchester-Croydon, £2 17s. 6d.; Birmingham-Croydon, £1 10s. The first-class train fares are £2 1s. 3d., £1 18s. 3d., and £1 3s. 2d. respectively.

NORTHERN ENGLAND AIR ROUTES.

The establishment of an air service linking Liverpool, Manchester and Birmingham to London and the Continent by air is under consideration by committees from the three cities, and a start is expected about the end of June. The service, which was proposed by Imperial Airways Ltd., will be confined to the Summer months at first. The Liverpool committee is authorised to offer £1,000 towards expenses.

At a conference on June 5 Sir Max Muspratt, who presided, said that there was no doubt about an early start. [And what about spending public subsidy-money on depriving Northern Air Lines Ltd. of legitimate trade?—C. G. G.]

THE KING'S CUP AIR RACE.

Cirrus Aero-Engines Limited announce that they will be very pleased to tune, free of charge, all engines of their manufacture entered in the King's Cup Air Race provided that the aircraft can be brought to their Works at Croydon Aerodrome at least two weeks before the day of the race.

The Cirrus Company will have mechanics and service men available at each of the control aerodromes, namely: Hanworth, Bristol, Manchester, Newcastle and Hull.

Cirrus Aero-Engines Limited are anxious that all entrants in the King's Cup Air Race requiring any assistance shall avail themeselves of the services of these mechanics.

A SHOPPING TRIP.

On Wednesday, May 28, Miss Winifred Spooner flew from London to Paris piloting one of the latest Hermes-Desoutter sports coupés, and taking with her as passenger Lady Currie, who wished to do some urgent shopping in Paris.

They left Croydon at 8.5 a.m. and arrived in Paris at 10.20 a.m., having taken only two and a quarter hours on the journey. After spending five hours shopping in the French Capital, they left Paris at 5 p.m., arriving at Croydon Aerodrome two and a half hours later.

Miss Spooner and her passenger were enthusiastic in praise of the comfort of the Desoutter coupé and the smooth running of the Hermes.

This was probably the first time two women have gone shopping to Paris by air without a mere male pilot or escort. And it seems to have been only the second (or third) time two women have flown across the Channel together,—the first and second trips were made out and home by Lady Bailey and Mrs. Longton to Rotterdam and back.

SHOPPING BY AIR-TAXI.—Miss Spooner and Lady Currie and the Desoutter (Hermes) monoplane.

Fit "TripleX" Regd -and be safe!
TRIPLEX PLATE TRADE MARK REGISTERED
TRIPLEX SHEET TRADE MARK REGISTERED

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MANY INVENTIONS.

The Whitsuntide Rush at Croydon was not only emphasised by almost all Continental Services running full, but by intensive joy-ride campaigns being run by Surrey Flying Services and the Henderson Air Taxi Co. One of these firms has had sandwich-men in pale blue berets and white overalls roaming about with a legend on their white backs urging all and sundry to come and joy-ride. Posters have been got out by one of these firms urging people to joy-ride in a British machine (with a foreign engine), and the other is expected to burst forth into a bright and snappy bit of counter-advertising, because though it employs a foreign machine it uses a British engine. Anyhow, both firms have been carrying bumper loads over the holiday.

Imperial Airways are doing a lot of specials at present, and their Cowes special Whitsun trip was heavily booked up. Other specials during the holidays by this firm were to Cardiff, Ostend, Oxford and Frinton. The latter was booked by a gentleman who, having had one look at the holiday road traffic, decided the only decent way to travel to Frinton was by air—and a very good judge, too, says we.

All the Imperial Airways taxi fleet being on jobs, it was necessary to hire a Desoutter monoplane for the Oxford trip, but no pilot of Imperial, who was available, had the 'bus on his licence. "Right," said Imperial, and before the client had ceased humming and ha'ing on the 'phone an Imperial pilot had got the Desoutter on his licence and was ready to start,—which is business.

There have been a great number of specials booked by famous jockeys recently, and a lot more "racing specials" are booked for the future. Most of the jockeys insist on having Mr. Jimmy Youell, of Imperial Airways, to pilot them over their aerial fences.

M. Labouchère, one of the best known figures of Croydon in the old *Grands Expresse* days, visited the aerodrome recently in his own Potez monoplane. He is now a director of Potez Ltd.

During the week Imperial Airways took the Secretary of State for Air, with several Members of Parliament, including a lady member, over London in an Argosy. It is understood they were able to look down the vast ventilator in the roof of the House of Commons through which the hot air mercifully escapes. There is always a nasty bump for an aircraft over this crater, especially when a lively debate is in progress.

K.L.M. at Rotterdam recently took up a large number of members of the Netherlands House of Parliament also.

Suffering, it is supposed, from a kick by a cantankerous kangaroo, the Brisbane correspondent of a well-known London daily wrote words in his agony which he will surely repent all his life. Describing a flight over his city by Miss Amy Johnson, he not only hailed her familiarly as "Johnnie" but described her as looping, spinning and rolling with all the "abandon of a bird."

Surely! surely! such expressions are neither chivalrous nor manly when applied to the heroine of the hour. Possibly when the parrot escapes and opens the patent fastener of the whiskey bottle and then suddenly remembers the worst of its seafaring days at the top of its voice, it may be permissible to refer to it as an abandoned old bird, but otherwise—tut, tut, my dear Sir—Really!

In a recent leading article the Editor of THE AEROPLANE suddenly accused the pale-eyed, fair-haired Nordic Race of perpetuating all the most sensational flights of modern times. It is not a nice thing to be accused of, this racial habit of suddenly flying to some remote corner of the globe for no discernable reason, but, as a brown-eyed, dark-haired Cornu-Celt, descended probably from those excellent Irish demi-gods, the Formorians, who, as their name suggests, invented the pleasant habit of having four more (Same again please, Miss) as soon as the drinking horn, mazer or tankard was empty, one cannot but rejoice at this editorial exposure of the pink-eyed, white-haired ancestral enemy.

The trouble with Nordics, of course, is that they *will* take themselves completely seriously despite the homeric, not to say gargantuan, laughter of the Celt. As for the nimble Dravidian, he is perpetually amused because Nordics in aeroplanes passing through his territories insist on being photographed in queer shorts and queerer pith hats surrounded by grinning aborigines and above all because the bovine Nordic thinks the grin is one of admiration and never suspects that it may be one of mockery.

The Nordics are the sort of stock who would claim Chirgwin as a racial hero (despite the Dravidians) on the grounds that he was pure Nordic for a considerable area round one eye. But the Editor should not be too hard on them.

After all, Rabelais, Edward Lear and Lewis Carrol used them for fabulously funny stories, and if, however unconsciously the Nordics make others mirthful, they have their uses in the world.—SPRY.

HERMES DOINGS.

The following extract from a letter from Gilbert-Lodge and Co. Ltd. (dated April 23, 1930), to Cirrus Aero-Engines Ltd., is of interest:—

"Following on our letter of the 9th instant, No. 90, we are now able to give you a little further information in connection with the arrival of Piper and Kaye in Sydney, and also regarding their engine when it was taken down for overhaul.

In the first place, we beg to enclose you herewith an original letter which we have received from General Aircraft Co. Ltd, containing their report on the overhaul of this engine. We can fully bear out what they say in regard to the excellent condition in which this engine came down.

After the reports which had appeared in the press from to time, outlining the progress of Piper and Kaye, and indicating that their forced landings were due to engine trouble, it was very pleasing to be able to invite people interested in Aviation at this end to inspect the engine after it was taken down.

You will also see from the General Aircraft Co.'s report that, in their opinion, the trouble which Piper and Kaye experienced was in the main due to overheating of the engine, through its being fitted with an unsuitable Cowling.

Before their departure for New Zealand, both Piper and Kaye were good enough to say that they were very enthusiastic about the Hermes engine, and that they had nothing but praise for it."

Extract from letter to Gilbert-Lodge and Co., Sydney, from the General Aircraft Co. Ltd., Sydney, dated Apr. 23, 1930:—

I have to report that we overhauled the Cirrus Hermes engine (No. 295) fitted to Desoutter Monoplane after its flight from England.

The engine was completely dismantled, cleaned and examined.

The engine was in excellent condition throughout and the trouble experienced by the fliers was caused in our opinion by the cowling which was unsuitable for tropical conditions.

Mr. Stack has now returned from Rome on his Hermes-Moth, and the times taken between the various stopping places are as follows:—Roma-Marseilles 4½ hours; Marseilles-Paris 5 hours; Paris-Brussels 2¼ hours; Brussels-London (Croydon) 2 hours—Total 13¾ hours.

The only work done on the engine throughout this flight was the cleaning of the plugs once. No other adjustment whatever was found necessary. During his stay in Rome, Mr. Stack gave several exhibitions of aerobatics.

NEW AVIAN PRICES.

Henlys (1928) Ltd., of Glasgow Terrace, Grosvenor Road, S.W.1, and Heston Aerodrome, who are the sole agents for the Avro Avian in this country, announce that the prices of the Avian have been reduced.

The latest prices are as follows: Avro Avian Mk. IV with wooden fuselage and Cirrus II engine: £575. Avian Mk. IV with wooden fuselage and Cirrus III engine: £595. Avian Mk. IV M with metal fuselage and Cirrus-Hermes engine: £795. Special Sports Model Avian with metal fuselage and Cirrus-Hermes engine, £825.

The Sports Model has a redesigned fuselage, a special light type cross-axle undercarriage, streamlined tank, and is similar in most respects to the Avian which Mr. Stack flew in last year's King's Cup Race.

A FAST TAXI RIDE.

On May 30 Mr. G. P. Olley, of Imperial Airways, flew to Madrid from Croydon, 1,200 miles, in one day with a passenger. He used a D.H.50 (Armstrong Siddeley Puma engine). The passenger transacted his business during the week-end and a return journey on June 2 took 10 hours, with one stop for refuelling. The fastest land service to Madrid is about 36 hours.

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Under the above title a short notice appeared in THE AEROPLANE last week concerning a policy under which the British Aviation Insurance Group underwrite the risk of a pilot's losing his licence and means of livelihood. Through an error it was made to appear as if total coverage was limited to £50, which is, of course, incorrect. The £50 limit applies to the costs of litigation in which the pilot may be involved concerning his licence.

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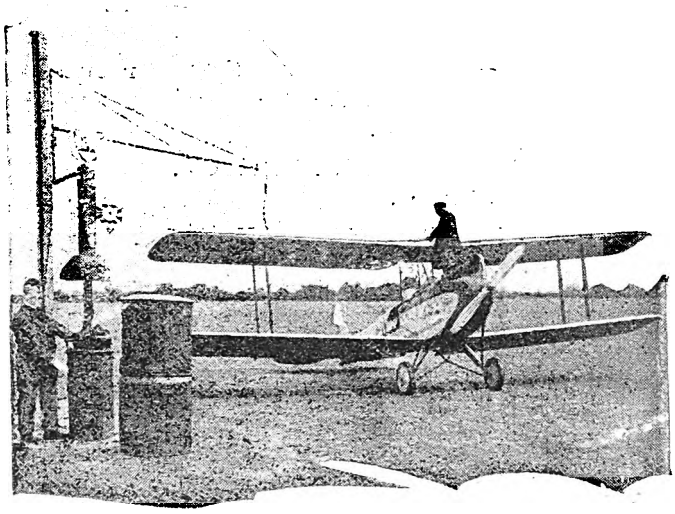

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PERSONAL NOTICES.

DEATHS.

DRAKE.—On June 6, at Cranwell, Lincolnshire, as the result of a flying accident, Henry Leonard Drake, Flight Lieutenant, R.A.F.

Flt. Lt. Drake entered the R.A.F. in July, 1925, with a short service commission for seven years on the active list with the rank of Flying Officer. He was a retired officer of the Indian Army. After a course of flying training at No. 4 Flying Training School, Abu Sueir, Egypt, he was posted to the Aircraft Depot, Karachi. In April, 1927, he was posted to the Aircraft Park, Lahore, and in October, 1928, he was posted to No. 5 (Army Co-operation) Squadron, at Quetta. He was restored to the Home Establishment in February, 1930, and after a short course at the Central Flying School, he was posted to the R.A.F. College, Cranwell, for duty as an Instructor.

FRANCIS.—At Malta, on June 5, as the result of a flying accident, Reginald Frederick Francis, Flying Officer, R.A.F.

Mr. Francis entered the R.A.F. with a short service commission in July, 1924, and, after a course of flying training at No. 2 F.T.S., Digby, he was posted to the School of Naval Co-operation, Lee-on-Solent. He was promoted to Flying Officer in February, 1926, and was posted to No. 202 (Flying Boat) Squadron, Malta, in 1927.

HARRIS.—At Malta, on June 5, as the result of a flying accident, Charles Drewery Harris, Leading Aircraftman, R.A.F.

VILLIERS.—On June 7, killed in a flying accident, George Ernest Villiers, younger son of the late Ernest Villiers and the Hon. Mrs. Villiers, of Homington House, Salisbury, aged 18.

MARRIAGES.

BARNETT—BOMER.—On May 31, at Fulmer, Flt. Lt. Percy John Barnett, M.C., R.A.F., younger son of Mrs. Barnett, of Heathcote, Gerrards Cross, to Marjorie Anna, younger daughter of Mr. and Mrs. Edward Bomer, of Marsham Manor, Gerrards Cross.

BOTT—BLUMENFELD.—The marriage took place, quietly, at Petworth, on May 24, between Mr. Alan J. Bott, of 24, D'Oyley Street, S.W., only son of the late Thomas Dugmore Bott, and of Mrs. N. C. Bott, of Pembroke Gardens, Kensington, and Josephine, daughter of Mr. and Mrs. R. D. Blumenfeld, of 176, Ashley Gardens, S.W.

[Mr. Bott is perhaps better known as "Contact."—ED.]

BURT—RENDER.—On June 5, at Middlesborough, Yorkshire, Percy Harry Burt, R.A.F., to Ivy Render, both of Harborne, Birmingham.

LEES—THOMPSON.—On June 2, at North Weald, Sq. Ldr. Alan Lees, R.A.F., elder son of Mr. and Mrs. Maurice Lees, Park Bridge, Ashton-under-Lyne, to Norah Elizabeth, second daughter of the late John Thompson and Mrs. Thompson, St. Oswald's, West Hartlepool.

SAYER—SMYTH.—On June 7, 1930, at Holy Innocents Church, Lamarsh, Philip Edward Gerald Sayer, son of Wing Cdr. E. J. Sayer, R.A.F. (retired), to May Violet Ellen, daughter of the Rev. J. W. Wallace Smyth, Lamarsh Rectory, Bures.

FORTHCOMING MARRIAGE.

CHARTERIS—GROSVENOR.—A marriage has been arranged between the Hon. Evan Charteris, K.C., and Lady Edward Grosvenor, widow of Lord Edward Grosvenor and daughter of the Earl and Countess of Kenmare.

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(II) All pilots immediately on landing will report to the Secretary's tent.

(III)—Entries for competitions will be taken on the aerodrome.

(IV)—Intending visitors kindly notify the Secretary, The Aerodrome, Hadleigh, Suffolk, stating Type and registration number of machine before 20th June.

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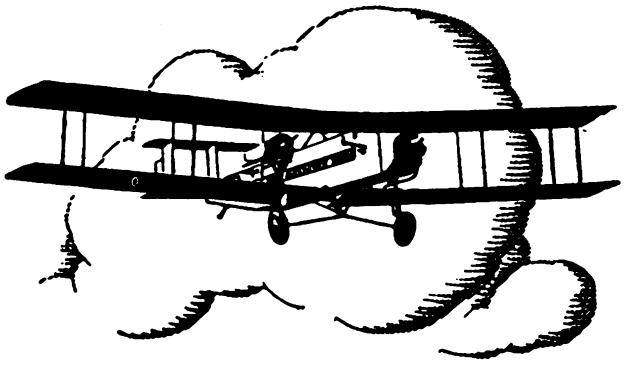

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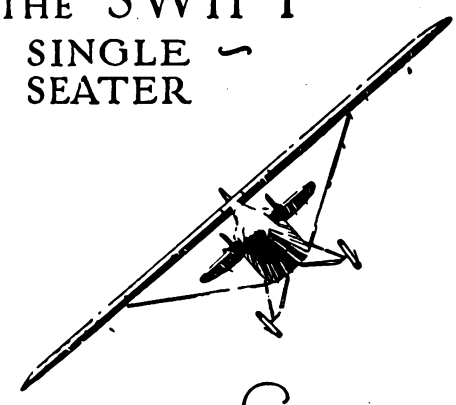

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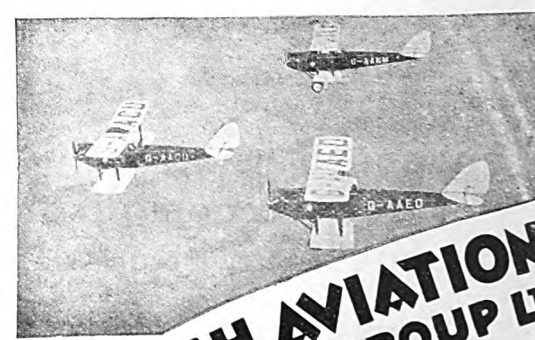
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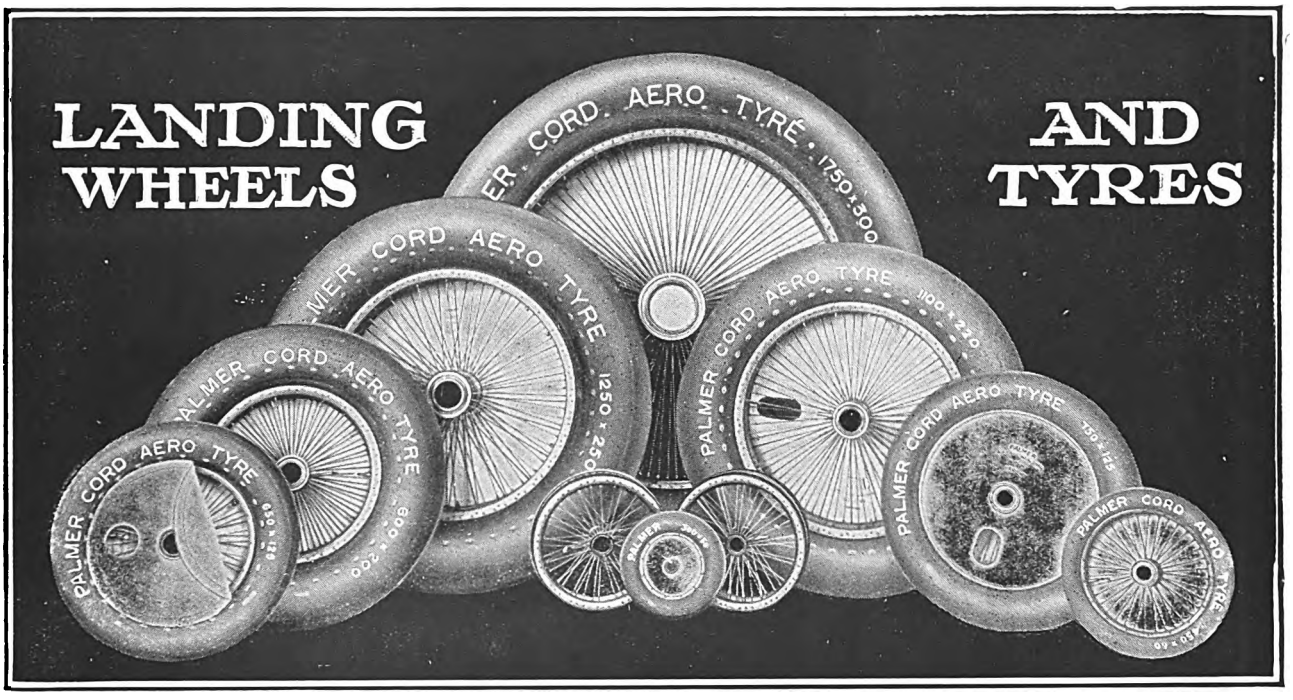

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Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
,,	195	130.	38.09	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575×60	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
600×75	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
,,	196	178.	55.	Central
600×100	188	120.	34.92	Central
,,	304	150.	38.09	104/46
,,	333	120.	34.92	Central
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
,,	336	178.	44.45	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
975×225	192	185.	60 32	Central
,,	194	185.	55.	125/60
1100×250	364	220.	60.32	Central
1250×250	314	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	305	304.8	152 4	Central
,,	306	304.8	101.6	Central
1525×325	197	304.8	101.6	Central
1750×300	139	400.	152.4	Central
,,	191	350.	150.3	Central
1750×350	193	400.	125.	Central
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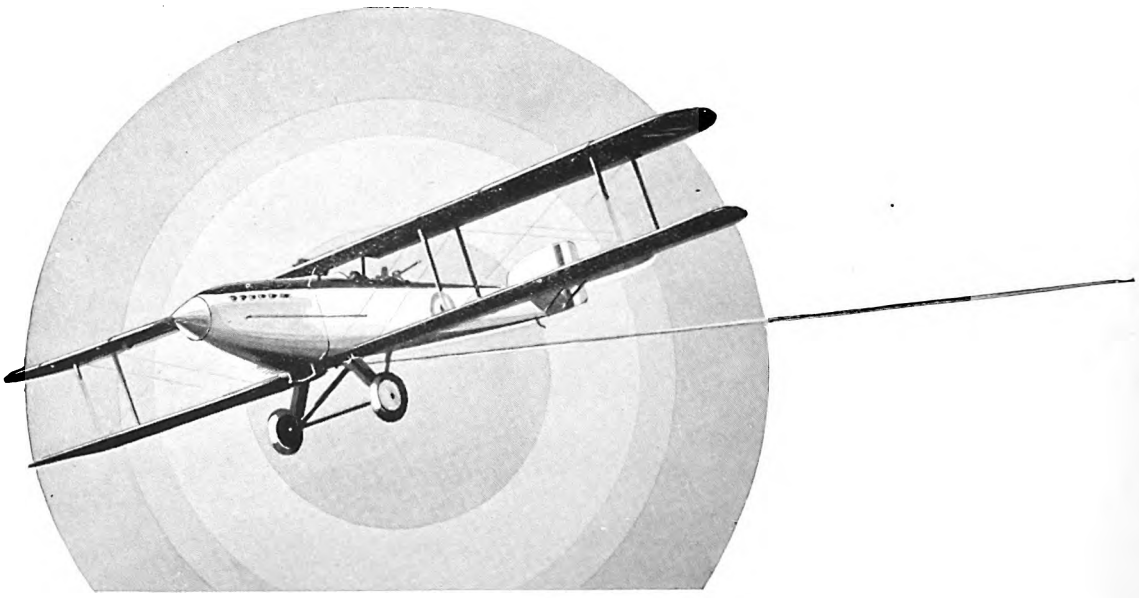

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Incorporating

Aeronautical Engineering

VOL. XXXVIII No. 25.

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ON LONDON'S AIR PORT.

According to the daily papers recently the old subject of the organisation of a proper Air Port for London is being revived. From the papers we gather that a deputation from the Air Ministry, consisting of Mr. Frederick Montague, our estimable Under-Secretary of State for Air, Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation and Major Rupert Mealing, whose particular occupation is the consideration of aerodromes in this country, were received by that august body the Park and Open Spaces Committee of the London County Council presumably by way of creating an open space in which to discuss this great problem.

In any other country but this the idea of the Chiefs of a Government Ministry turning themselves into a deputation to wait upon a Local Council would be considered comic. In a well-ordered state of society the Local Council would be hauled before the Chief Bureaucrats of the Crown or the Dictator or the President or the Soviet and would be allowed graciously to show cause why the Ministry should not act in any manner which they thought proper. Or, more probably, a Minister of the Crown, or etc., or perchance, a favourite of the Dictator, would merely do what he liked best and would rap sharply over the knuckles any Local Council which dared to protest.

In England, we do things differently. We are merely a limited monarchy with a hard-working aristocracy, and certain very competent and equally hard-working senior Government officials, who do their best for the people in the face of tyrannical City Councils and Urban District Councils and County Councils. Consequently, when our Air Ministry wants to do anything to improve the conditions of Civil Aviation, its chiefs have to go hat in hand to the London County Council and ask civilly whether that august body will be so good as to consider the possibilities of having an aerodrome somewhere within reasonable reach of the middle of London at some future date.

In actual fact the London County Council is a very well-informed and intelligent body, and probably its level of intelligence is higher than that of the average elected committee in any line of business. Therefore, we may assume that these preliminary conversations between the Chiefs of Civil Aviation and the London County Council progress on amicable and intelligent lines.

What the Newspapers Say.

From the daily papers one gathers that these conversations have included the discussion of the possibility of aerodromes in the following areas:—Hyde Park, Regent's Park, Battersea Park, Wormwood Scrubbs, and Hackney Marshes.

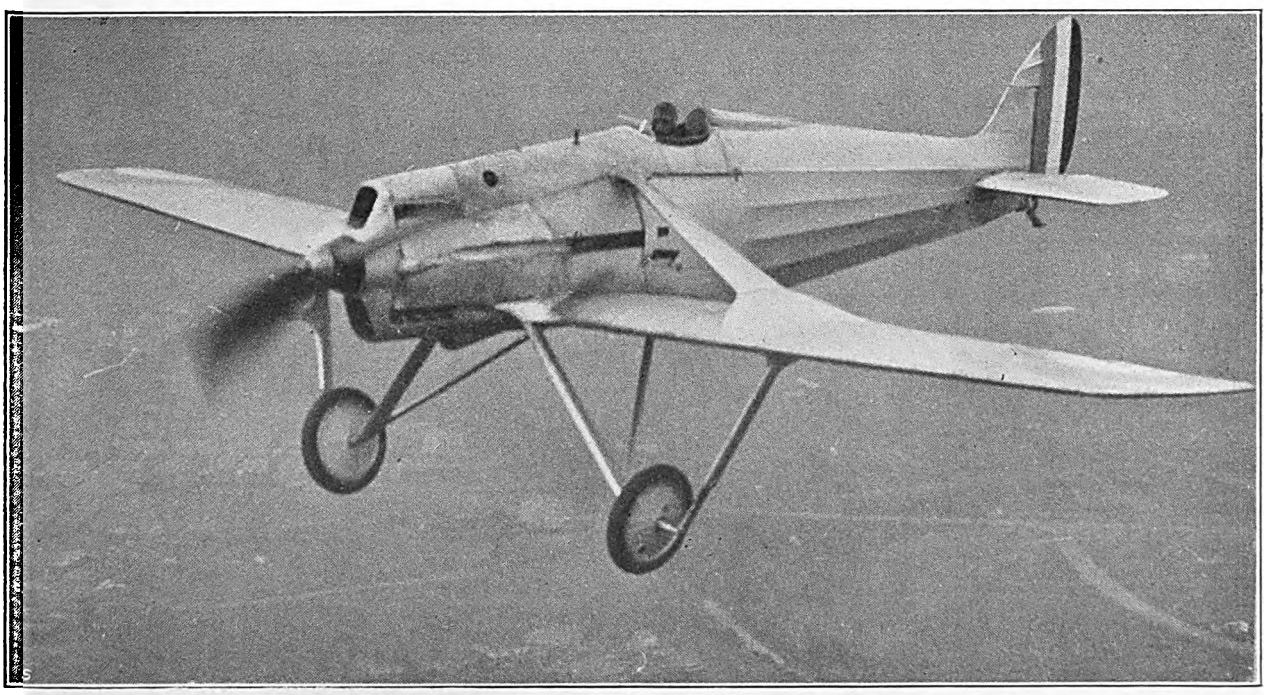
We are told that the deputation pointed out to the London County Council the inconvenience of Croydon because of its distance and inaccessibility, which adds forty minutes to the air journey to the Continent. We are also told that Sir Sefton Brancker said that they had considered Hyde Park and Regent's Park, and that the first had been turned down as impossible some time ago, but that the urgency of the subject had since caused it to be revised.

The Daily Telegraph adds on its own account,—"Hyde Park, as a matter of fact, would be eminently suitable in many respects, especially for private residents who had taken up civil aviation for themselves."

The prospect of Hyde Park being used as an aerodrome by private individuals who would probably have only just qualified for their "A" licences, is too devastating to contemplate otherwise than as a calamity. Apart from that, any attempt to use Hyde Park as a public aerodrome would inevitably cause rioting, if not a positive revolution.

Hyde Park is the one place which must always remain sacred to the pedestrian Londoner. The periphery of Hyde Park, has of late, been contaminated by admitting taxicabs to it. But until then, it was the one place where the Londoner could walk or sit in peace and contemplate either a purely rural landscape, or watch the progress of the vehicles of the respectable classes, or attend Bolshevik or Anarchistic or Atheistic meetings, as best pleased him.

"THREATEN THE THREATENER, AND OUTFACE THE BROW OF BRAGGING HORROR."—(SHAKESPEARE—*King John*)



THE INTERCEPTER FIGHTER.—The latest De Havilland product, with Napier "H" engine, described elsewhere in this issue.—(*"Aeroplane" photograph.*)

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To turn part of Hyde Park into an aerodrome would be robbing the Londoner of the best patch of open country within reasonable reach—despite the London General Omnibuses which carry silver rabbits on their radiators. Whatever our good friend Sir Sefton Brancker may say or think to the contrary, Hyde Park must definitely be barred as an aerodrome.

For much the same reason, Regent's Park should also be barred. The only point in favour of Regent's Park is the remote possibility that some unusually reckless aviator might possibly land in the Zoo and be devoured by wild animals.

Battersea Park is equally out of the question. Apart from the fact that it is much too narrow from North to South to provide a really good landing-ground or getting-off place in the prevailing South-West winds, it is essentially the play-ground of that particular area, where a play-ground is more than usually necessary. One remembers the great Mr. Augustine Birrell, when he was Chief Secretary for Ireland, introducing his Home Rule Bill with the statement that he had pondered the clauses of this Bill in Battersea Park, "an area populated chiefly by small children consumed with a desire to know the time." Surely we could not for a moment consider depriving these time-loving children of their pet pastime.

CLAIMS TO CONSIDERATION.

Hackney Marshes have a certain claim to consideration in that they are not far removed from Lee Marshes on which Mr. A. V. Roe, now Sir Alliott, made his first experimental hops. But in fact the road from Central London to Hackney Marshes is so congested and so tortuous that the vans of the various air transport companies would take much longer to reach Hackney Marshes than they do to reach the aerodrome at Croydon. Furthermore, Hackney Marshes being to the North and East of London, are liable to fogs when Croydon to the South-West is free. And at all times all the areas to the North-East of London are under smoke-clouds when the South-West has clear skies. That was one of the reasons against the old Handley Page aerodrome at Cricklewood, which otherwise had many claims to consideration as London's chief aerodrome.

There remains then Wormwood Scrubbs. This is an area which is far more entitled to consideration than any of the others. In the first place, it is conveniently situated,—with Wormwood Scrubbs jail on the one side of it and Kensal Green cemetery on the other. Few places could be better suited for the manœuvres of aviators.

Apart from that, Wormwood Scrubbs is comparatively easy to reach by road, and a little branch railway from Wood Lane would make it still more easy to reach by tube. The obvious drawback to it is that it is directly on the West side of London, so that all air-line machines from the Continent would have to fly practically over Croydon to reach Wormwood Scrubbs. By the time they had reached the Scrubbs and their passengers and goods had got back into London, the probability is that as much time would be taken up as if they had landed at Croydon when they were passing over it.

THE CLAIMS OF CROYDON.

Considering the matter perfectly seriously, Croydon is quite good enough as the main London aerodrome until such time as we have aircraft of types very different from any which exist to-day or are likely to exist for the next four or five years.

Before powers could be got from Parliament and ground could be properly laid out and buildings erected in Hyde Park or Regent's Park or any of those places we ought to have produced passenger-carrying aeroplanes which will be capable of alighting in a very much smaller space than anything which is being considered as an aerodrome to-day. So why disturb the resorts of the people when they will not be wanted after they have been disturbed?

Croydon itself is quite a reasonably good aerodrome, but the worst objection to it is that at certain times of the year it is subject to fogs. Certainly one takes a little time to get to Croydon but unless one has extremely bad luck in the traffic, Croydon can always be reached from say, St. James's Square or the vicinity of Piccadilly Circus in twenty-five or thirty minutes.

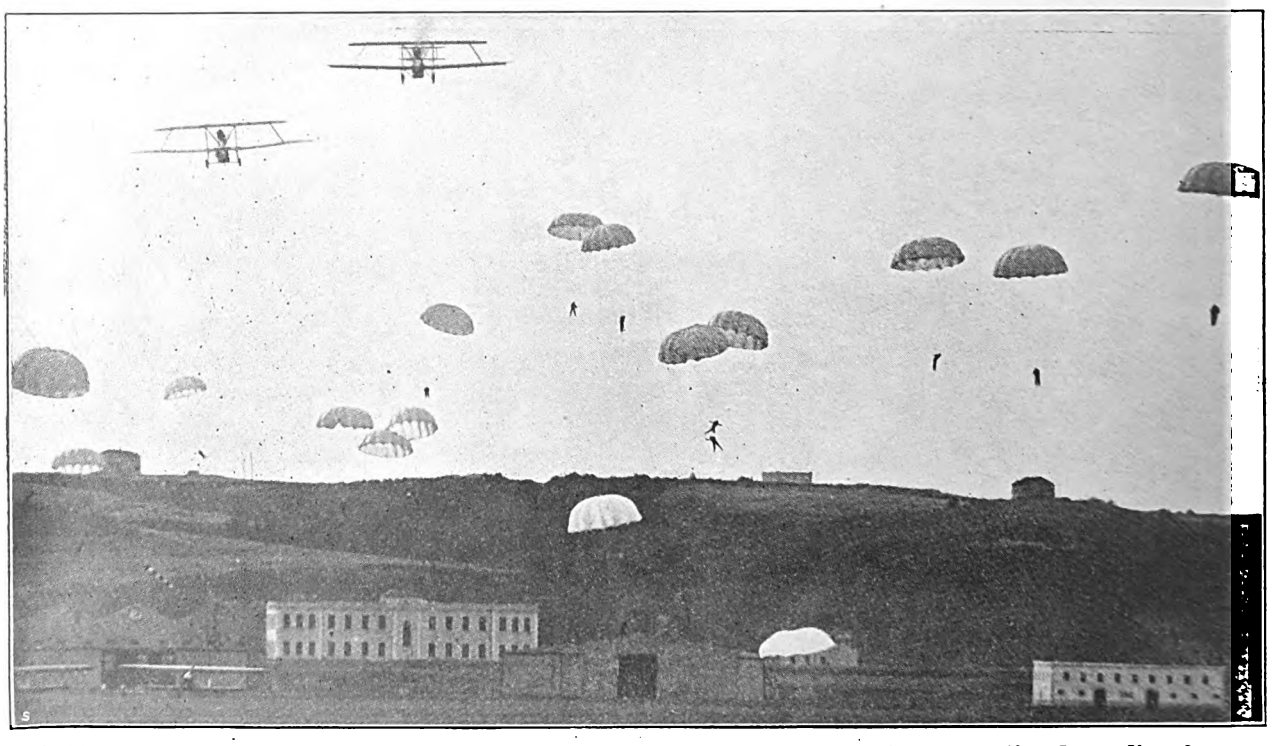
A certain amount of time could quite well be saved in getting the passengers away after they arrive at Croydon. Admittedly the time taken over formalities is much less than is the time taken in getting through the Customs and so forth on the ordinary rail and boat journey. But then we must remember that in these we are dealing with the Marine Mind, which has no conception of time or space, and that the air mind ought above all others to be careful about saving time.

If machines were always out on the concrete with their engines running ten or fifteen minutes after the telephone message has been sent through from London saying that the 'bus had left with the passengers and baggage, then they ought to be off the ground within five minutes of the arrival of the 'bus at Croydon. Probably five or ten minutes could be saved at each end of the journey this way.

In the course of this conference between the Air Ministry and the London County Council the statement was made that the journey to Croydon causes a loss of forty minutes in the total journey from London to Paris or elsewhere. The very best possible landing ground anywhere nearer the centre of London would take fifteen or twenty minutes to reach from, let us say, Haymarket or Charles Street or St. James's Square, and so the net saving could not possibly be more than something between fifteen and twenty minutes on each journey. The mention of forty minutes lost in going to Croydon suggests that forty minutes would be saved elsewhere,—which it could not.

A TEMPORARY MEASURE.

The fact is that the forty minutes cannot be saved in any case, and the question is whether, for the sake of saving ten or fifteen or even twenty minutes, we could justify the vast expense of building a big aerodrome nearer the middle of London? Personally one firmly believes we could not.



SAVED TO MAKE A ROMAN HOLIDAY.—Sixteen gallant fellows of the Regia Aeronautica descending from two Caproni bombers at the great Air Display at Rome on June 12, for the benefit of the Orphans of Airmen. The parachutes used were Salvators, of the same make as that which saved Major de Bernardi.

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One's personal opinion is that we should carry on with Croydon until we are ready for a really big step forward. By making proper arrangements with the Southern Railway, which after all is not a bad railway when you treat it properly, the Air Ministry ought to be able to arrange to run an electric train from Victoria to Waddon in certainly not more than ten minutes. At comparatively small expense a branch line could be taken from Waddon either under or over the main road and up that part of the Brighton Road known as Purley Way, right into the aerodrome itself.

Then passengers would in the first place go to Victoria Station. Imperial Airways, Air Union, K.L.M. and the others would have their offices down alongside Victoria Station and that would become the actual air terminus in London. All the trouble and expense of running special 'buses and so forth could be abolished, and the whole thing could be worked by electric trains, considerably accelerated, direct from Victoria Station to the aerodrome.

This would cause very much less trouble and very much less expense than trying to dig up Hyde Park or Wormwood Scrubbs or Battersea Park. And instead of causing ill-feeling on the part of the people whose playground would be thus destroyed, everybody would be pleased all round.

The Ultimate Aim.

In the course of two or three years if we really set to work about it, but anyhow in the course of the next eight or ten years, allowing for our national inertia, we ought to have aeroplanes which will sit down on any reasonably flat roof. And we ought to be able to catapult them off instead of making them take a long run as they do at present.

Perhaps one is a trifle optimistic in the time mentioned. When we consider that all the benefits of the Handley-Page slot, and the methods by which it could be used to the greatest advantage, were discussed at considerable length in The Aeroplane in the year 1920, and when we consider that to-day the Handley-Page slot is only used as a kind of modified sky-hook on the upper planes of certain makes of aeroplane, instead of being used fully as it might very well have been five years ago, we may perhaps more reasonably consider that we shall have to wait another ten or perhaps fifteen years before we produce the type of aeroplane which ought to be used for commercial air transport. But when we do produce it the location of the Central London Aerodrome is perfectly obvious. It has already been pointed out by Sir Sefton Brancker.

One forgets the precise occasion, but Sir Sefton was looking a little forward when he said that the proper place for the Central Air Port of London was on top of the area between Victoria Station and the River. He suggested that this area should be completely roofed over and made into an aerodrome.

If we had in this country business men with the kind of enterprise which the business men of some other countries possess this would all have been done several years ago, purely as a business speculation. The only wonder is that the same people who had the enterprise to buy up Devonshire House and build the existing huge masses of concrete there, and who had the enterprise to buy up Grosvenor House and build those rather elegant buildings alongside Hyde Park, had not just the extra little bit of vision to buy up the area between Victoria and the river.

At present a good deal of it is perilously near being slum area, but what used to be the rather disreputable district of Pimlico is showing signs of becoming mildly fashionable. With a little persuasion the river frontage between Vauxhall Bridge and Chelsea Bridge might be made almost as fashionable as the bit the other side of Chelsea Bridge.

Now if somebody were to buy up all those houses along that river frontage, starting a matter of a couple of hundred yards to the West of Vauxhall Bridge, and were to put up there some very tall buildings, somewhat after the style of the Grosvenor House buildings, and were to put over the whole lot a flat roof, a matter of four hundred yards square, or even less, there you would have your aerodrome ready made, and you would have an extraordinary valuable property below it.

The buildings underneath the aerodrome would naturally have to be artificially lighted, except those on the outside. But the problem of ventilation would present no difficulty, because the aerodrome would be none the worse for having ventilation grids let into it at frequent intervals. Everything else would be a perfectly straightforward series of engineering problems.

Such a position has every possible advantage. In the first place the prevailing wind is from the South or the South-West. After being catapulted off this platform machines would clear the edge of the building, and if anything should happen to go wrong just as they were leaving they would be able to glide down into the river at a place where it is fairly wide. Aeroplanes coming up to this aerodrome from Croydon, where probably the bulk of the machines would be stored, at any rate at first, would have a fairly clear run over Mitcham Common, Tooting Common, Wandsworth Common and Clapham Common, and then Battersea Park, all within gliding distance in case of forced landing on the way. There is probably no other area in Central London which can be approached by a series of open spaces in the same way.

Machines coming from Holland, or even from France for that matter, might save time by coming across country to somewhere about Woolwich and then hopping across the intervening mile or two of houses to the River and following the River up to the London aerodrome. Probably the distance by that route would work out almost the same as the present distance to Croydon. And thus quite a considerable amount of time and trouble would be saved.

The Need for Time.

Just at the present moment the scheme is probably not absolutely workable, because even with an aerodrome 400 yards square, there would be a certain amount of danger of machines dropping onto houses to the South and West and to the East and North, if they had engine failure when getting off towards or coming in from those directions. But as soon as catapults become a general and recognised method of launching, as they must do sooner or later, then the roof aerodrome becomes such an obvious proposition that the continuance of the old-fashioned grass aerodrome at Croydon as a passenger terminal will be merely ludicrous.

All aeroplanes in that time hence will necessarily have brakes, so that they will be able to pull up on a good concrete surface in a matter of 25 or 30 yards after touching. Also they will be properly fitted with slots, so that though they will have to cruise at something between 120 and 150 miles an hour, if they are to compete in the regular air traffic of the World, they will nevertheless be able to alight at certainly not more than 30 miles an hour and pull up within a few yards. Such aeroplanes are not an effort of the imagination, they are obviously within sight. They could be built within the next six months, if anybody would put up the money to build them.

Catapults.

Therefore, there remains merely the question of the cataput. Practically all Service aeroplanes built to the order of the Air Ministry for the Fleet Air Arm have to be built to stand catapulting, though most of our Fleet machines fly off the flat decks of our aircraft carriers. And incidentally they are all fitted with brakes so that they can pull up short on the flying-deck of a carrier.

In this little matter our Fleet Air Arm is ahead of international Civil Aviation, but, and here strangely enough the Marine Mind is ahead of the Commercial Mind, the French mail steamer *Isle de France*, and the North German Lloyd liner *Bremen*, have already shown us that Civil Air Transport will have to be catapulted.

Therefore, given the catapult, given the slow landings, and given the brakes to pull up sharply, there is really no need for this roof aerodrome to be more than at most 250 yards square. Purely to provide for a factor of safety the landing surface would have to be provided with rails all the way round, which could be raised and lowered at will. When the machine was coming in to land the railings on the leeward side would be lowered and those on the windward side would be raised, so that if by any bad chance the brakes of the machine failed to act, she would do no more than creep gently into the railing, which naturally would be so constructed, with wire cables instead of the ordinary fence rails, that they could not break under any possible shock put upon them by the attack of an aeroplane.

Look at the matter as a simple engineering proposition and as a simple commercial proposition and, though it may seem to be highly technical, it is at the same time one of the simplest things in the whole World. Any big group of capitalists who really wanted to make money out of real estate and out of flying at the same time,—as in a different way Mr. Norman and Mr. Muntz have so successfully invested in real estate at Heston, in the certitude that they cannot lose money on it as real estate and may make a fortune out of it as a centre of aviation,—anybody ought to buy up as much as possible of that land by the River between Vauxhall Bridge and Chelsea Bridge and proceed to put up a building with an aerodrome on the roof.

The whole thing is about the most obvious money-making proposition in London at the present moment. The chief difficulty naturally would be with the ground landlord. And probably that is what will stop some enterprising individual or firm from taking on the job within the next year or two.

Probably what will happen in the end will be that the local ground landlords will hang out for usurious profits and ultimately will be compelled by Act of Parliament to sell for considerably less than they could get at the present moment. But sooner or later an aerodrome of that sort is bound to come, and we should be foolish to mess up Hyde Park for temporary use while waiting for it to be built.—C. G. G.

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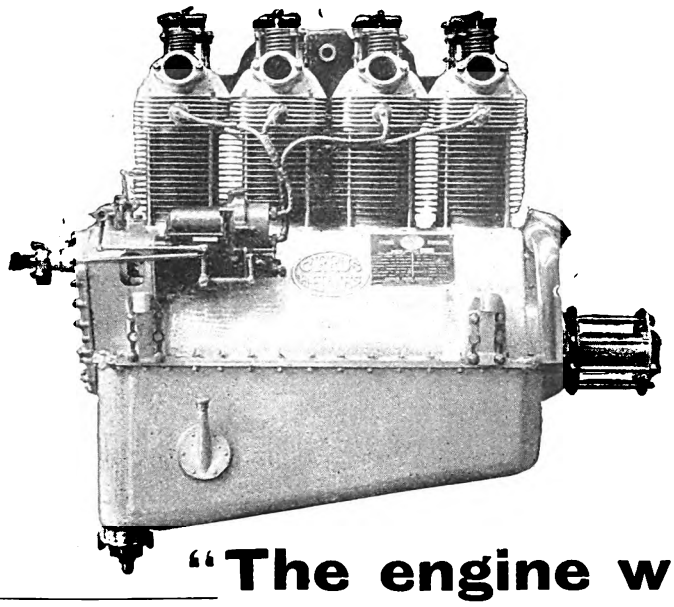

105/115 h.p. Cirrus Hermes Engine.

"The engine which made the light aeroplane of to-day possible"....

"The Times" Eng. Suppt.

The Cirrus was the pioneer 4-cylinder in-line air-cooled, low-power engine, and was first produced in the original 60 h.p. Cirrus engine in 1925.

¶ ***"This engine is installed as standard, or as an alternative, in nearly every light aeroplane in the world."*** ***"AIR," May, 1930.***

49 aircraft manufacturers, in various parts of the world, fit Cirrus and Cirrus-Hermes engines in 63 distinct types of light aircraft, seaplanes, flying boats and multi-engined machines.

¶ ***"Practically every great flight in the history of light aeroplanes has been performed with an engine of Cirrus make."*** ***"FLIGHT," March, 1930.***

ENGLAND TO AUSTRALIA in 15½ days 12000, miles—Pioneer flight and fastest time.

ENGLAND TO INDIA 5,500 miles—Pioneer flights by 2 machines.

SWEDEN TO SOUTH AFRICA 9,000 miles flight with passenger.

ENGLAND TO AUSTRALIA 12,000 miles flight with passenger.

ENGLAND TO SOUTH AFRICA 8,000 miles in 13 days—fastest time.

AROUND THE AUSTRALIAN CONTINENT 8,000 miles flight.

AROUND THE AFRICAN CONTINENT 18,000 miles flight by lady pilot.

ENGLAND TO CHINA 14,000 miles—Pioneer flight with passenger.

ENGLAND—S. AFRICA—ENGLAND 25,000 miles—Pioneer flight.

ENGLAND TO AUSTRALIA 12,000 miles. Cabin machine with passenger.

ENGLAND TO SOUTH AFRICA 8,000 miles flight by lady pilot.

ENGLAND—GOLD COAST 5,000 miles flight.

CIRRUS ENGINE

CIRRUS AERO-ENGINES LIMITED

REGENT HOUSE, 89 KINGSWAY, LONDON *Telephone—Holborn 4076. Cables—"Ocirruso, London"*

Aeromarine

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AN AIR MINISTRY APPOINTMENT.

The Secretary of State for Air has appointed Mr. C. Ll. Bullock, C.B., C.B.E., to be Secretary of the Air Ministry in succession to Sir Walter Nicholson when the latter vacates the appointment in the autumn.

Mr. Bullock has for the last seven years been Principal Private Secretary to successive Secretaries of State for Air.

NO AERODROME IN HYDE PARK.

In the House of Commons on June 4, in reply to a question by Mr. Sanders, the First Commissioner of Works said that the question of permitting part of Hyde Park to be used as an airport had not been brought to the notice of his Department. He had no intention of giving countenance to any such project.

LATE ENTRIES FOR THE KINS'S CUP RACE.

The following late entries have been received for the King's Cup Race:—

97. G-AAFH—George G. Parnall—H. A. Presto—Parnall Elf—(Cirrus Hermes). [Who is Hey Presto?—Ed.]

98. G-AAVD—W. R. Westhead—W. R. Westhead—Southern Martlet—(Genet II).

99. G-AAGI—Miss F. M. Wood—Miss F. M. Wood—D.H. Moth—(Gipsy I).

100. G-EBXG—M. D. L. Scott—M. D. L. Scott—D.H. Moth—(Cirrus II).

101. G-AASG—O. F. Maclaren—G. A Pennington—D.H. Moth—(Gipsy I).

WITHOUT COMMENT.

The Wellington (New Zealand) correspondent of *The Daily Telegraph,* in a message dated June 16, says:—

I understand that three American concerns are investigating the possibilities of commercial aviation in New Zealand. Each firm is ready to assist financially and technically, and to provide machines on attractive terms.

This latest attempt to Americanise the Dominion is meeting with considerable resentment, and I understand that strong influences are at work in an attempt to induce British aircraft companies to come here.

Several local companies are anxious to commence operations, but the Government at present refuses to grant subsidies.

Should British firms show any interest in repelling the new American invasion, it is possible that the Dominion Government might assist. Capital to the extent of £60,000 can be underwritten here. At least five three-engined twelve-passenger machines would be required to operate between Auckland, Wellington, Christchurch and Dunedin.

Unless Britain takes a hand the New Zealand skies are likely to be as full of American aeroplanes as her roads are full of American cars.

[This is published without comment. But one would remind readers of the allegory of the sailor's parrot.—C. G. G.]

A SPECIAL SUPPLEMENT.

Next week's issue of The Aeroplane dated June 28 will contain a Special Supplement devoted to the products of Sir W. G. Armstrong Whitworth Aircraft Limited and Armstrong Siddeley Motors Limited. The method of producing the Armstrong-Whitworth all-steel aircraft will be illustrated and described in detail, as will the method of heat-treating steel as invented by the firm. Also the range of Armstrong-Siddeley engines will be dealt with extensively, and illustrations will be published of the workshops of the two great factories operated by these firms.

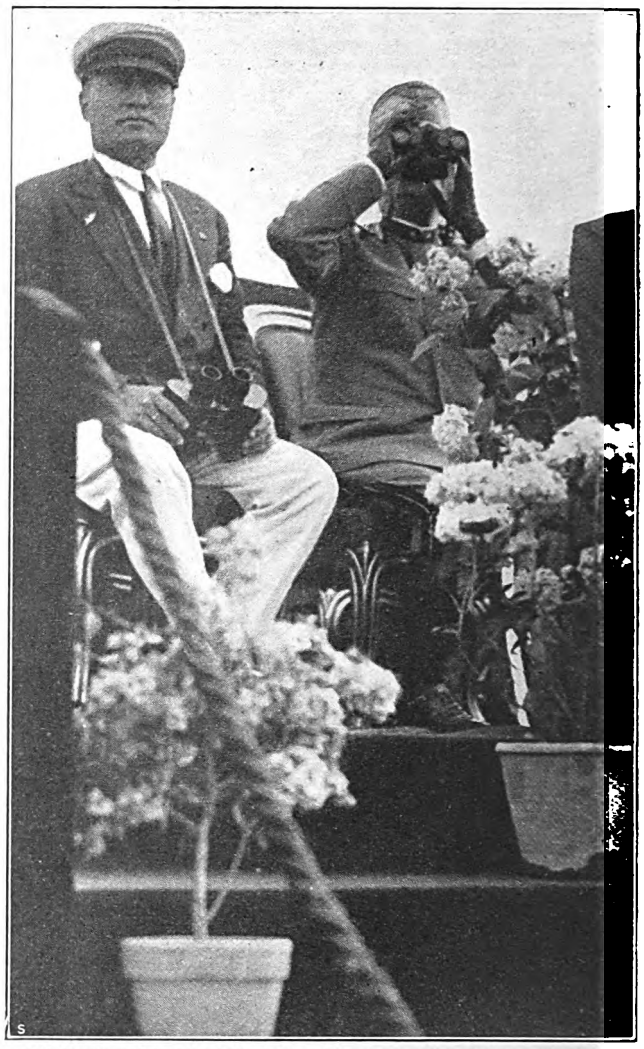
The group of firms which come under the control of Armstrong-Siddeley Proprietary Ltd. is, one imagines, the biggest financial undertaking devoted entirely to aircraft in the British Empire, and therefore this Supplement will be of particular interest. All those who are interested in the more serious side of aeronautical engineering should make a point of ordering this issue from their newsagents so as to make sure of delivery. The number produced is necessarily limited because The Aeroplane does not accept unlimited returns of unsold copies from the newspaper trade as do some papers which claim large circulations.

THE R.A.F. DISPLAY AND THE KING'S CUP RACE.

Readers of The Aeroplane are reminded that the issue dated July 2 will contain a full report of the R.A.F. Display at Hendon together with some preliminary notes on the King's Cup Race which will take place on the following Saturday. The issue dated July 9 will contain a full account of the King's Cup Race, which this year has not only secured a record number of entries but includes a number of new types of aircraft whose performances will be watched with intense interest and will have considerable influence on the progress of aviation all over the World.

There is bound to be a big demand for these issues from foreign countries and consequently those who want to make sure of securing copies in this country should order them forthwith from their newsagents.

Advertisers also are reminded that these two issues are regarded by the Military, Naval, Air Force and Civil Aviation Authorities of all foreign countries as being of particular importance because they show the development of the Royal Air Force and the lines on which our civil aircraft are developing. Therefore they are read with great care and are afterwards filed for reference, and consequently have even higher advertising value than have the regular weekly issues of The Aeroplane.



ROYAL INTEREST.—His Majesty the King of Italy and His Excellency Benito Mussolini at the Display by the Regia Aeronautica on June 12.
(By courtesy of the Italian Embassy.)

A SPANISH OVER-SEA SERVICE.

On June 11 a new air service was inaugurated between Madrid and the Canary Islands. A three-engined Junkers set off from Getafe for Casablanca, where an intermediate stop is planned.

IMPORTANT DATES.

June 19.—N.F.S. Meeting at Nottingham.
June 21.—Annual Air Rallye at Haldon Aerodrome.
June 21.—Competition for the Gywnn Maddocks Cup at Heston.
June 26.—Ipswich Air Pageant (Suffolk and Eastern Counties Aeroplane Club). Official opening of Ipswich Municipal Aerodrome.
June 27.—Annual Dinner, R.A.F. Dinner Club.
June 28.—Royal Air Force Display at Hendon.
June 30.—Flying-boat and Seaplane Assembly at Brighton.
July 5.—King's Cup Air Race (Royal Aero Club—Hanworth).
July 9—12.—R.A.F. Athletic Championships at Uxbridge.
July 13.—N.F.S. Meeting at Leeds.
July 19.—Hanworth Garden Party.
July 20—Aug. 7.—International Touring Competition, starting from Berlin.
July 26.—Norwich Flying Meeting (Norfolk and Norwich Aero Club) (with R.A.F. support).
Sept. 1—6.—International Congress on Air Navigation at The Hague.
Sept. 6.—Official opening of Mr. Lindsay Everard's private aerodrome at Ratcliffe, Leicester.
Sept. 6—28.—International Aero Exhibition at Stockholm.
Sept. 20.—Liverpool Air Pageant (Liverpool and District Aero Club and Lancashire Aero Club) (with R.A.F. support).
Sept. 27.—Air Pageant at Hanworth.
Nov. 28—Dec. 14.—International Aero Exhibition at Paris.

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HENRY SEGRAVE.

On June 13, Major Sir Henry O'Neal de Hane Segrave was killed on Windermere by the capsizing of the motor-boat *Miss England II* in which he had just beaten the World's Speed Record for water-borne craft. The evidence seems to show that the boat hit a water-logged branch of a tree, had part of the step ripped off, and then overturned.

That the winner of so many dangerous motor-car races, and the holder of so many records, who had been dangerously wounded and crashed in aeroplanes during the War 1914-18 should die in what is generally considered to be a safe sport is a curious stroke of fate. He himself knew it to be dangerous, but most people do not think it so.

Our only consolation is that, if he had to be killed in trying to break a speed record, he was not killed when flying or motoring. Motor-boating affects so few people, comparatively, that his death cannot be used as an advertisement for themselves by the opponents of those greater methods of transport which are so constantly attacked by people who have no foresight or imagination.

By the death of Sir Henry Segrave British Aviation has suffered the worst blow that it has had for many years. As everybody who is at all intimately concerned with aviation knows, his services as Technical Adviser had been acquired recently by a very powerful financial group who are interesting themselves in the Aircraft Industry. The first-fruit of his advice has just appeared in the Segrave Meteor which, without departing in any way from thoroughly well-known aerodynamic and mechanical practice, is to all intents and purposes a new type of aeroplane of precisely the kind which in larger or smaller sizes is definitely wanted.

Henry Segrave came to the Aircraft Industry with a mind which had never got into a groove in aeronautical ideas. He knew all that needs to be known about flying, and his lengthy experiments in streamlining speed-cars had taught him a great deal more than most aircraft designers know about reducing head-resistance. His natural ability enabled him to foresee the commercial prospects of aircraft of different kinds, and with such a combination of qualifications there is no telling what might have been the outcome of his association with the great financial powers by which he was employed.

By his death the progress which might have been made in this way must be hindered, and we can only hope that those who so justifiably placed their trust in his judgment may be so fortunate as to discover another adviser of something like the same ability.

Henry Segrave was born in Baltimore, U.S.A., on Dec. 22, 1896, and was of Irish descent.

When War broke out he was at Eton and thence entered Sandhurst. He was gazetted to the First Battalion the Royal Warwickshire Regiment in December, 1914, and served with that regiment in France. He learned to fly in a Maurice Farman biplane at the Central Flying School, Upavon, towards the end of 1915. His Royal Aero Club Certificate No. 2090 is dated Nov. 19, 1915.

In 1916 he married Miss Doris Stocker, who was one of the most charming and most competent young actresses of the time. By her marriage the English Stage lost one of its most promising members.

He was seconded to the Royal Flying Corps in January, 1916, and served in England with No. 19 and No. 32 Squadrons before being posted overseas to No. 29 Squadron in April, 1916. He was appointed Flight Commander in May, 1916, and posted to H.Q., British Expeditionary Force.

Before the end of 1916 he had been three times wounded and in his last crash one of his legs was so badly damaged that it left him with a permanent injury. As a result he was posted in January, 1917, to the War Office with the temporary rank of Captain and in May, 1918, he was appointed to the Department of the Chief of the Air Staff, Air Ministry, where he was Technical Secretary to Lord Rothermere, who was then Air Minister.

In 1918 he was attached to the British Aviation Mission, Washington, which went to America to help the development of Military Aviation in the United States. In this he was very successful, partly because of his American birth and partly by virtue of his own personality.

After the Armistice he left the Royal Air Force and turned his attention to motor racing. In this activity his career is too well-known to need any mention in this paper, beyond recording the facts that he won the French Grand Prix in 1923 and a number of other important races on the Continent in 1924, 1925, and 1926. He also won the 200-mile Race at Brooklands in 1921, 1925 and 1926 and was a member of the winning team in 1922 and 1924.

In 1926 at Daytona Beach, Florida, he put the World's Speed Record for Motor-cars up to 203.988 m.p.h. and on Mar. 11, 1929, he raised the record still further to 231.362 m.p.h. For these feats, and in recognition of the service thus done to British prestige, he was rewarded with a knighthood and received the accolade from the King at Bognor,—the first ceremony of this kind performed by His Majesty after his grave illness.

Henry Segrave was altogether an unusual personality. He combined a high degree of personal charm with an inflexibility of purpose and a power of organisation which brought success to all his undertakings. Like all successful men he had his detractors, but the worst they ever found to say against him was that he could put up a good bluff and that he was a show-man. None ever dared to attack his personal courage or his honesty of purpose. And those who called his bluff found always that he held a stronger hand than his bluff ever suggested, and those who thought that he was making a show with insufficient backing found that he was probably making a show of some minor thing to distract attention from something more important which he held in reserve.

The pity is that those who scoffed at the idea of Henry Segrave setting up as a technical adviser on air affairs will never be taught the lesson which would have come to them if he had been allowed to live and to fulfil the plans which he had conceived. Perhaps he was taken from us to prevent us from progressing more quickly than would have been good for us.

His determination was undefeatable. When he wanted anything he got it,—by diplomacy, by argument, or by sheer strength of character. One well remembers an instance not long after the Armistice. When the members of the British Aviation Mission wanted to get home, and shipping was scarce, and women were not allowed to travel on the Atlantic lines, and the import of motor-cars was forbidden, and dogs from foreign countries were not admitted to this country under any conditions, young Henry Segrave, then 22 years of age, arrived smiling from the States with his wife, a large American automobile, and a pure-bred British bull-dog. How he did it one never learned. And when he was asked he just laughed, in that way he had when he was treating anything difficult as rather a good joke, and said it was quite easy when you knew how.

He treated all his serious problems that way. The story of the building of the Meteor and all the difficulties he met in the process, as he told it, was one of the funniest things that ever happened. And the designs, as he sketched them out on the table-cloth at lunch one day a few months ago, were just comic pictures done for fun. Yet the whole thing had meant weeks of arguing and demonstrating, and the overcoming of opposition from people with conventional ideas, and the spurring on of people who had the good old English habit of letting things take their course.

Perhaps one of Henry Segrave's greatest qualities was that in spite of all his great successes and his immense (and well deserved) popularity his manner towards his early friends never altered. He had supremely that quality of good breeding, the ability to "stand corn,"—his head was never turned by success. In him England has lost a potentially great man.

To his father and his wife all concerned with Aviation will offer the deepest sympathy. Those of us who knew him well have lost a friend whose place can never be filled.—

C. G. G.

The finest possible tribute to Henry Segrave appeared in *The Times* of June 14. It reads thus:—

> He was a very brave man; but he was not a rash or a reckless man: he never took unnecessary risks. But his being was concentrated on attaining speed. Such a man guards against danger only in so far as it would hamper him in his purpose. If he thinks about death at all, swift death in a moment of triumph is probably the end that he would desire.
>
> It has yet to be shown that humanity is any the better for the speed in movement which the experiments and the achievements of a SEGRAVE put within its reach. But, if speed is nothing, the spirit that urged SEGRAVE to speed is a great and noble thing. It is the spirit of adventure, of courage, of honourable emulation, which, however useless its objects may be, is in itself a higher thing than that which would suffer human life to drag listlessly on in grooves of habit, and of indifference. By his courage, his determination, his vitality, his devotion to an end, SIR HENRY SEGRAVE set an example to all. A man of genius in his own field, he must be counted among those who have deserved well of their kind, and his name will be remembered in honour.

MESSAGES FROM THE ROYAL FAMILY.

The following message has been sent to Lady Segrave by Lord Stamfordham on behalf of the King and Queen:—

> It is with much regret that the King and Queen have learned of the tragic death of Sir Henry Segrave. I am commanded to convey to you the expression of their Majesties' heartfelt sympathy in your irreparable loss. The King recalls with pleasure the occasion at Bognor Regis when he conferred a knighthood on Sir Henry, and his Majesty mourns the death of one whose intrepid adventures on land and water were the admiration of all the world.

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The following telegram has been sent to Lady Segrave by the Prince of Wales:—

Please accept my deepest sympathy in your and the country's great loss.—EDWARD, P.

FROM THE ROYAL AERONAUTICAL SOCIETY.

Colonel the Master of Sempill, President of the Royal Aeronautical Society, sent the following telegram to Lady Segrave on June 13:—

In very real sorrow I am sending you, on behalf of all the members of the Royal Aeronautical Society, these few words attempting to convey our deepest sympathy on the irreparable loss you have suffered by the death of your gallant and widely talented husband. He had only recently, much to the satisfaction of his many friends and associates, returned to aviation, in which he had filled such a distinguished part during the War, and he had only just been elected a member of the Society. His loss will be very keenly felt.

AN EPITAPH FOR AIR OR SEA HEROES.

This, from *The Times* of June 15, seems peculiarly fitting:—

Sir,—May I suggest, as an epitaph for any gallant adventurer by air or sea the closing lines of Hérédia's splendid sonnet, *La Mort de l'Aigle*?

Heureux qui pour la Gloire ou pour la Liberté,
Dans l'orgueil de la force et l'ivresse du rêve,
Meurt ainsi, d'une mort eblouissante et brève!

13, Belgrave Road, S.W.1. G. E. TROUTBECK.

VICTOR HALLIWELL.

At the Inquest on Mr. Victor Halliwell, who died with Sir Henry Segrave in trying to beat the World's Record for speed on the water, Mr. Handley, solicitor, of Windermere, addressing the Coroner on behalf of Rolls-Royce Ltd., Sir Henry Royce, and Mr. Cooper, asked leave to state the circumstances in which Mr. Halliwell came to be in the boat and met his death.

Mr. Halliwell was a graduate of Bristol University and chief experimental aero engine tester of Rolls-Rolls Ltd. Derby. That firm would like it to be made clear that Mr. Halliwell's duty was finished when the boat was launched and the engines were found to be turning over properly.

Later, he undertook, at Sir Henry Segrave's request, to assist with the installation of them. When Sir Henry Segrave decided that the time had come to make a test of the boat under official condtions he said he would like a Rolls-Royce man in the boat and suggested Mr. Halliwell as the best man for the job.

Mr. Halliwell must have realised the grave risk he was taking and the grave responsibility he incurred as a man with a wife and child, and he must also have realised that if the record was broken, as it was broken, it would be broken by Sir Henry Segrave and not by Halliwell and Willcocks, and therefore that he had nothing to gain except the consciousness of a job of work very well done. But he was assured by Sir Henry Segrave's associates that from the point of view of the men who worked for him one of the most striking characteristics of Sir Henry Segrave was his intense anxiety that the fullest possible credit should be given to the men who by their skill and devotion to his service and by sharing his risks had made his own exploits possible.

If Sir Henry Segrave had survived he would have been the very first to have insisted that the honour gained by him should be shared by Halliwell and Willcocks in a very slightly varying degree and only second to Sir Henry's own.

Mere words could be no consolation at all, but Rolls-Royce Ltd., Sir Henry Royce, and Mr. Cooper, his clients, did hope that these facts might be some solace to Mr. Halliwell's widow and family, when they realised that the manner of his death did typify the spirit of all that was best in British sport. They very deeply regretted the loss of a very brave man, and offered their profound sympathy.

ELMER SPERRY.

Mr. Elmer Ambrose Sperry, the inventor of the gyro-compass, gyroscope aeroplane and ship stabilisers, and numerous devices for the uses of Navies, died in New York on June 16 at the age of 69.

Mr. Sperry was born at Cortland, New York, in 1860, and studied at Cornell University. At the age of 20 he founded the Sperry Electric Co. of Chicago, and made arc-lamps, which were very successful. Later he made electric mining machinery and other apparatus.

After that he founded the Sperry Electric Railway Company, of Cleveland, which was bought by the General Electric Company of New York in 1894. He invented the chlorine detinning process and the electrolytic process, which produced white lead from impure by-product lead.

In 1915 he made a new high-intensity arc searchlight, which gave a brilliancy over five times as great as any earlier type. This has since been the standard equipment of the armies and navies of most nations.

The gyro-compass, from which his name is best known, was first installed in the battleship *Delaware* in 1911. He was appointed to the Consulting Board of the U.S. Navy in 1915, and became chairman of the committees on aeronautics, mines, and torpedoes, and aids to navigators.

In 1918 he invented a wireless control for aeroplanes which he claimed made possible the direction of an aerial torpedo against a target up to 35 miles.

The awards to Mr. Sperry included the Grand Prix of the Aero Club de France in 1914, the Franklin Medal (Philadelphia, 1914), the grand prize for gyro-compasses and gyroscopes at the San Francisco Exposition in 1915, and the John Fritz gold medal, the highest award in the United States engineering profession, in 1926.

He was decorated by the late Tsar for his inventions in navigation equipment, and by the Emperor of Japan.

He was a founder of the American Institute of Electrical Engineers, and of the American Electrochemical Society.

From 1910 onwards he was president of the Sperry Gyroscopic Co. of Brooklyn, which manufactured his inventions, for which he held over 400 patents in the United States and Europe.

His son, Lawrence Sperry, who was a singularly brilliant young man, and did much good work for aviation, was drowned near Hythe, while trying to swim ashore from an aeroplane in which he had come down a mile or so from land while flying to France.

F. R. SMITH.

With deep regret this paper has to announce the death, on Sunday, June 15, of Mr. F. R. Smith, Chief Engineer of Armstrong Siddeley Motors Ltd. Mr. Smith had been with the firm for over fifteen years and his loss will be regretted by very many friends in the Motor and Aircraft Trades

THE INTERNATIONAL AIR CONGRESS.

The annual congress of the *Fédération Aéronautique Internationale* opened in Paris on June 10. M. Laurent Eynac, French Minister for Air, was in the chair.

The meeting happened to begin on the 25th anniversary of the foundation of the Federation by the Comte de la Vaulx who was recently killed in a flying accident in the United States. Many delegates paid tributes to his services.

Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, was present at the opening session.

Among the ceremonies on the first day was an entertainment of delegates by the Municipality of Paris at the Hotel de Ville, where the visitors signed the Golden Book.

On June 12 the Congress of the F.A.I., in session in Paris, decided that the contest of the *Challenge Internationale de Tourisme* should be held biennially instead of annually. As the Schneider Trophy Contest is also held once every two years (if challenges are forthcoming) the light aeroplane tour will be so dated as to avoid its occurrence in the same year as the Schneider Contest. This year it will start from and finish at Berlin.

The Aeronautical Clubs of Norway, Egypt and Luxemburg were elected to membership of the F.A.I. on Thursday.

At its closing session on June 13 the Congress decided not to elect a new president in the place of the Comte de la Vaulx, but to leave the office vacant until next November as an act of homage to him. The present committee will remain in office under the presidency of M. Luiz Ferry.

Senhor Santos Dumont, the veteran Brazilian balloonist and aviator, who made the first aeroplane flight in Europe, and was the first to build and operate a dirigible airship, suggested that a gold medal bearing the name of the Comte de la Vaulx should be awarded annually to the most meritorious pilot of a commercial air line, and the proposal was accepted. The cost of the medal will be defrayed by voluntary subscription among the member countries.

The Congress also decided to erect a memorial to the Comte de la Vaulx on the spot near Jersey City, U.S.A., where he met his death.

IRELAND AND THE AIR.

The growing interest taken by citizens of the Irish Free State in aeronautics is shown by the following motion recently handed to their Parliament by a member:—

That in the opinion of the Dail, the Executive Council should take immediate steps to assist the development of civil and commercial aviation; and to provide adequate facilities for the training and certification of civilian pilots.

In the event of the motion being passed there should be a rapid increase in the number of pilots in the Free State which is very fitting for a country which is in a remarkably good geographical position for becoming the Eastern base of trans-Atlantic air route in the dim future.—E. F. MCS.

[As usual Ireland, after being in the forefront with Mr. Harry Ferguson's monoplane at McGilligan Strand in 1910, and with a fine meeting at Leopardstown in 1911, has dropped into a backward state.—C. G. G.]

THE ZEPPELIN LOG.

According to a message from Berlin, the log of the *Graf Zeppelin* shows that she flew 18,595 miles in 298 hours 32 minutes on her flight to South and North America and back. This is an average of slightly more than 60 m.p.h.

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The ATLAS TWO-SEATER

An Aircraft with many applications.

THE Atlas 2-seater steel aeroplane has been used for three years as standard equipment for the Royal Air Force. It has a wide field of application and can be used for army co-operation duties, for advanced two-seater training and as a seaplane. It is available with the Jaguar or Jag ar Major engine, with which it becomes a two-seater fighter of outstanding quality.

SIR W. G.

ARMSTRONG WHITWORTH

AIRCRAFT LIMITED

Works and Aerodrome: Whitley, Coventry. London: 10 Old Bond Street, W.1.

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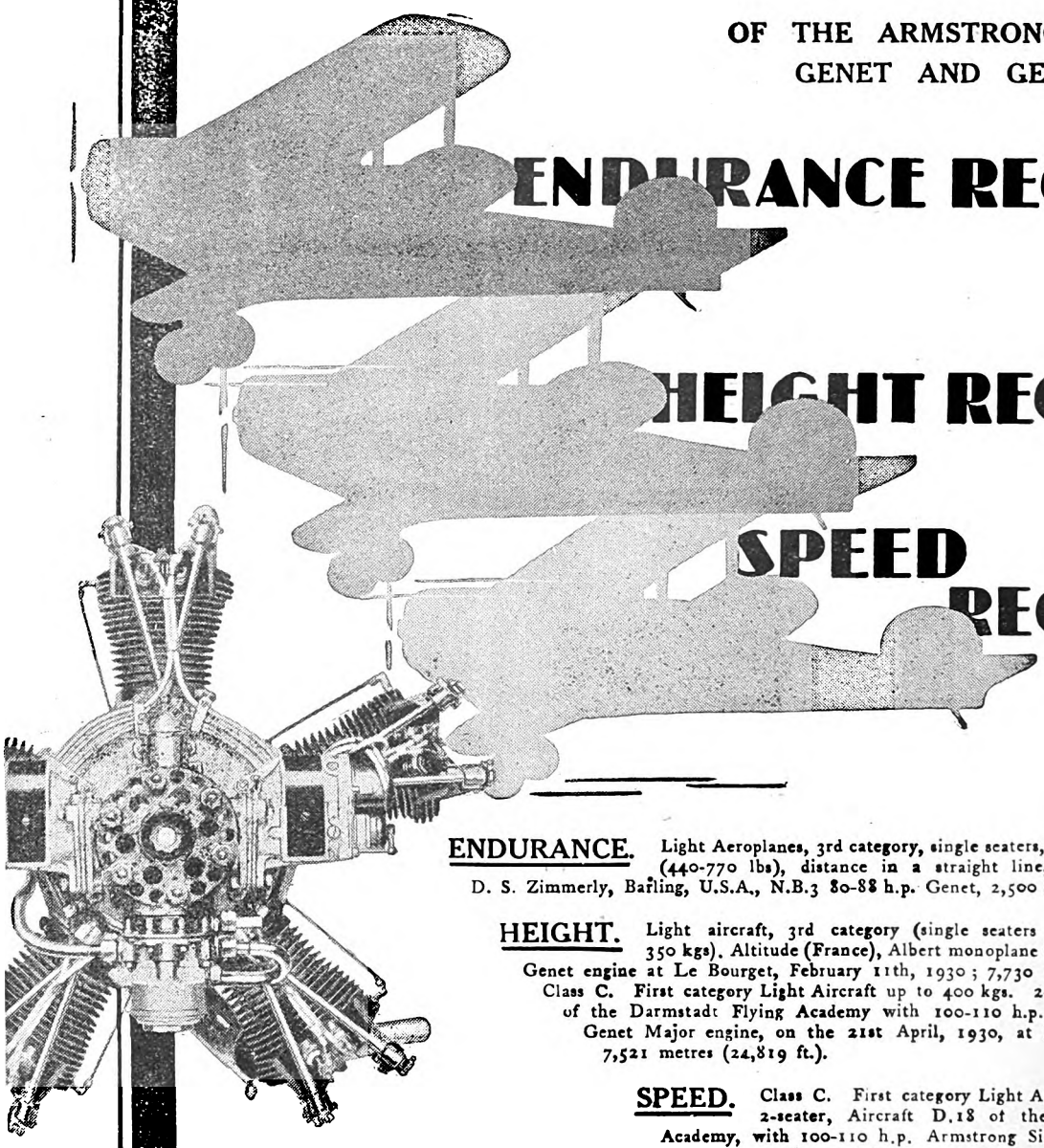
4 WORLD'S RECORDS

OF THE ARMSTRONG SIDDELEY GENET AND GENET MAJOR



ENDURANCE. Light Aeroplanes, 3rd category, single seaters, weight 200-350 kgs. (440-770 lbs), distance in a straight line, July 17th, 1929; D. S. Zimmerly, Barling, U.S.A., N.B.3 80-88 h.p. Genet, 2,500 kms. (1,553 miles).

HEIGHT. Light aircraft, 3rd category (single seaters weighing less than 350 kgs). Altitude (France), Albert monoplane fitted with 80-88 h.p. Genet engine at Le Bourget, February 11th, 1930; 7,730 metres (25,509 ft.). Class C. First category Light Aircraft up to 400 kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 21st April, 1930, at Darmstadt; Height, 7,521 metres (24,819 ft.).

SPEED. Class C. First category Light Aircraft up to 400 kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy, with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 23rd April, 1930 at Darmstadt; 214.848 kms. (134.3 miles) per hour over 100 kms (62.5 miles).

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, June 10.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—Wing Cdr. G. B. Dacre, D.S.O., is granted the acting rank of Group Captain whilst seconded as Adviser to the Greek Ministry of Aviation.

Flg. Off. D. M. Rees, M.B.E., is placed on the retired list, and is granted permission to retain the rank of Flt. Lt. (June 6). Flt. Lt. J. Bullock is placed on the retired list (June 8). Flg. Off. A. V. Harvey is transferred to the Reserve, Class A. (May 7) (substituted for the notification in the *Gazette* of May 13). The S.S. comn. of Plt. Off. on probation N. S. Lesmere is terminated on cessation of duty (June 6).

ACCOUNTANT BRANCH.—The following are granted perm. comns. as Plt. Offs. on probation with effect from and with seniority of June 2:—D. Lumgair (Lt., Cheshire Regt., T.A.), C. G. Sharp, C. A. Proffitt, P. Griffiths, R. Peel, J. G. Wigley, W. J. R. Cann, R. F. Fleming.

MEDICAL BRANCH.—H. R. Clein, M.B., B.Ch., is granted a S.S. comn. as a Flg. Off. for three years on the active list, with effect from and with seniority of Mar. 31; Flt. Lt. R. Boog-Watson, M.B., Ch.B., D.P.H., is promoted to the rank of Sq. Ldr. (June 7); Flt. Lt. (Quartermaster) H. Steele is promoted to the rank of Sq. Ldr. (Quartermaster) (June 5).

CHAPLAINS BRANCH.—The Rev. J. H. P. Still, M.A., is promoted to the relative rank of Wing Commander (May 24).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—Flg. Off. L. A. Lewis is transferred from Class C to Class A (May 19); Flt. Lt. D. G. Allison is transferred from the Special Reserve to the Reserve, Class C (May 30).

Appointments.

Week ending June 16.

GENERAL DUTIES BRANCH.—Group Captain J. B. Bowen, O.B.E., to R.A.F. Depot, Uxbridge, Supernumerary, on transfer to Home Establishment, 10/5.

Squadron Leaders N. W. Wadham, to H.Q., Fighting Area, Uxbridge, 27/5. P. G. Scott, to H.Q., R.A.F., Cranwell, 9/6. L. F. Forbes, M.C., to No. 4 F.T.S., Egypt, 19/5.

Flight Lieutenants G. L. Gandy, to No. 70 Sqdn., 'Iraq, 30/4. R. M. Foster, D.F.C., to R.A.F. Depot, Uxbridge, 29/4. C. F. Toogood, to No. 9 Sqdn., Manston, 2/5. W. A. Tattersall, to H.Q., Inland Area, Stanmore, 1/6. D. H. Carey, to No. 99 Sqdn., Upper Heyford, 15/6. E. S. Borthwick-Clarke, to No. 17 Sqdn., Upavon, 30/4. M. H. Ely, to No. 209 Sqdn., Mount Batten, 2/6. J. C. E. A. Johnson, to R.A.F. Depot, Abukir, 29/5.

Flying Officers E. A. Swiss, to R.A.F. Base, Gosport, 3/6. J. D. H. Slade, to No. 462 Flight, 3/6. H. C. Parker, to No. 448 (F.S.R.) Flight, 4/6. J. P. Domville, to H.Q., R.A.F., Transjordan and Palestine, 31/5. V. J. Sofiano, to H.Q., R.A.F., Transjordan and Palestine, 6/6. C. E. V. L'E. Feasey, to R.A.F. Practice Camp, Sutton Bridge, 2/6.

Pilot Officer G. R. Warner, to No. 16 Sqdn., Old Sarum, 4/6.

MEDICAL BRANCH.—Flight Lieutenants G. E. Church, to Princess Mary's R.A.F. Hospital, Halton, 20/6. J. Hill to Princess Mary's R.A.F. Hospital, Halton, 28/6.

Flying Officer G. O. Williams, to Station H.Q., Kenley, 30/6.

STORES BRANCH.—Flight Lieutenants H. T. H. Copeland, to Base Supply Depot, 'Iraq, 16/4. W. St. J. Littlewood, to Central Supply Depot, 'Iraq, 27/4.

Flying Officers C. Thripp, to H.Q., R.A.F., Cranwell, 2/6. C. I. Fry, to Aircraft Depot, 'Iraq, 20/5.

ACCOUNTANT BRANCH.—Wing Commander P. J. Wiseman, to Station H.Q., Manston, 2/6.

Squadron Leader T. C. Miller, M.C., to A. and A.E.E., Martlesham Heath, 2/6.

Flying Officers S. C. George to Station H.Q., Heliopolis, 26/5. J. MacL. Murray, to No. 47 Sqdn., Khartum, 26/5.

RESERVE OF AIR FORCE OFFICERS.—Flight Lieutenant T. M. Walker (Medical), to Station H.Q., Bicester, on being employed with the Regular Air Force, 2/6.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of a collision in the air at Upavon, Wiltshire, between a Horsley machine of No. 100 (Bomber) Sqdn., Bicester, Oxon, and a Bulldog machine of No. 3 (Fighter) Squadron, Upavon, on June 12, No. 335796, Sjt. Frederick Ernest O'Meara, the pilot of the Horsley aircraft, was killed. His passenger, No. 359791, L-AC. William Hagan, and Plt. Off. Lord Malcolm Avondale Douglas-Hamilton, the pilot and sole occupant of the Bulldog aircraft, were not injured. [A mock battle between a Horsley and a Bulldog is one of the events in the R.A.F. Display Programme.]

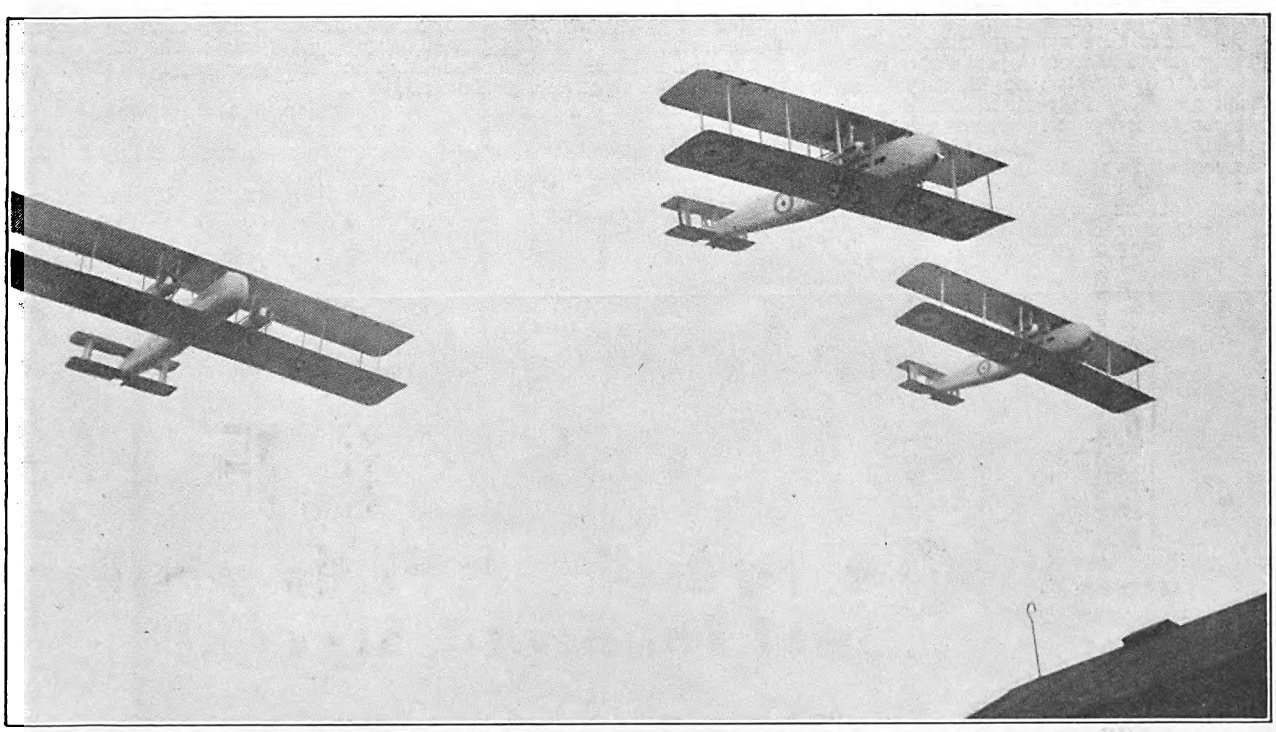
The Air Ministry regrets to announce that as the result of an accident at Wittering, Peterborough, to a Moth machine of the Central Flying School, Peterborough, on June 13, Flt. Lt. Nigel Henry Neville Fletcher, the pilot and sole occupant of the aircraft, was killed.

The Air Ministry regrets to announce that as the result of an accident at Kohat; India, to a Wapiti machine of No. 60 (Bomber) Sqdn., Kohat, India, on June 13, No. 363654, Sjt. Edward Albert Hindelang, the pilot of the aircraft, was killed, and No. 335828, L-AC. William Henry Lansdell, sustained injuries from which he died on June 14.

The Andover Display.

An Air Ministry order states that a flying display is to be given at Andover aerodrome on June 20. No aircraft, other than those taking part in the display, are to land at Andover on that day except in cases of emergency.

The display to which this Order refers is the annual At Home given by the Air Officer Commanding and Officers of the R.A.F. Station, Andover, in the course of which a display of flying is given by various Units of the R.A.F.



TROOPERS.—The Flight of Vickers Victoria troop-carriers (two Napier Lion engines) which are taking part in the R.A.F. Display on June 28 before being posted to their Squadron overseas. This is the first photograph of a formation of Victorias in this country.—(*"Aeroplane" photograph.*)

DO NOT FORGET THE R.A.F. DISPLAY ON JUNE 28.

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CURIOSER AND CURIOSER.—The Westland-Hill two-seater Pterodactyl (Armstrong Siddeley Genet engine), which will be seen at the R.A.F. Display on June 28.

Attached Personnel and the R.A.F. Display.

Regular personnel of the Royal Navy and Army or of the Dominion Air Services attached to the R.A.F. are entitled to the same privileges with regard to free admission for themselves and guests to the R.A.F. Display as personnel of corresponding ranks in the R.A.F.

A Flight to Iceland.

Two Blackburn Iris flying-boats (three Rolls-Royce Condor engines) of No. 209 (Flying Boat) Squadron, R.A.F., Mount Batten, will leave Plymouth Sound on June 21 to fly to Reykjavik in Iceland, where they will represent Great Britain at the celebration of the thousandth anniversary of the foundation of the Icelandic Parliament.

On leaving Plymouth the Flight will head due north and will follow the west coast to Stornoway a distance of between 500 and 600 miles from Plymouth. The 700 miles journey from Stornoway to Reykjavik will be broken at the Faroe Islands where the machines will re-fuel. The Flight, which will be commanded by Wing Cdr. S. W. Smith, O.B.E., will remain at Reykjavik for about a week.

Squadron Leader A. S. C. Stuart-MacLaren.

Squadron Leader A. S. C. Stuart-MacLaren, O.B.E., M.C., D.F.C., A.F.C., who has recently been placed on the Retired List on account of ill-health, was born at Whitchurch, Oxfordshire, in 1892 and was educated at Charterhouse.

He enlisted in the Royal Flying Corps in December 1914 and went to France in February 1915. While serving in France he learned to fly in a Caudron biplane at Le Crotoy and was granted a Royal Aero Club certificate in June 1915. In July 1915 he returned to England on appointment to a commission in the King's Own Scottish Borderers (Special Reserve) and two months later he was seconded to the R.F.C. for duty as a Flying Officer.

He passed a course at the Central Flying School and in September 1915 he was posted to No. 14 Squadron, R.F.C., on its formation and went to Egypt with the Squadron at the end of that year. He served with distinction in Egypt and in July 1916 he was awarded the Military Cross for conspicuous gallantry in action.

In October 1916 he was appointed Flight Commander with the temporary rank of Captain and in November 1916 he was awarded a Bar to the Military Cross again for conspicuous gallantry in action. He was also Mentioned in Dispatches from Egypt in December 1916.

In April 1917 he was restored to the Home Establishment and served with various training squadrons and as a Ferry Pilot to France until August, when he returned to Egypt. In March 1918 he was posted to No. 122 Squadron on the Home Establishment with the temporary rank of Major.

On July 28, 1918, he left England in a Handley Page twin-engined biplane to fly to Egypt through France and Italy, and reached his destination on Aug. 7. This was the first flight to the Middle East by an aeroplane of this type.

In November 1918 he was appointed to the Air Ministry for duty with No. 1 Air Route. In December 1918 he was awarded the Air Force Cross "in recognition of gallantry in flying operations against the enemy." In December 1918 he was awarded the O.B.E. for distinguished services rendered during the War.

At the end of 1919 he was placed on the unemployed list and in September 1920 he was appointed to a permanent commission with the rank of Flight Lieutenant. In November 1920 he was posted to No. 216 Squadron in Egypt and in May 1921 he was posted to No. 208 Squadron for duty with the Aden Flight. In April 1922 he was appointed to command the Aden Flight and in May 1922 he was promoted to Squadron Leader.

In May 1922 the Air Council expressed its appreciation of his services during the operations in Somaliland and in October 1922 he was awarded the D.F.C. for distinguished services during active service operations in Somaliland in March of that year.

He returned to England in February 1923 and after four months' leave he was posted to No. 1 School of Technical Training for administrative duties. After a course of Air Pilotage at Calshot he was posted in November 1923 to the Marine Aircraft Experimental Establishment at Felixstowe.

In February 1924 he left Calshot in a Vickers Vulture flying-boat in an attempt to fly round the World. The machine was wrecked at Akyab and the relief machine in which he continued the journey was wrecked at Komandorski, an island in the North Pacific, in August, when the attempt was abandoned. He and his companions had covered over 12,000 miles in spite of difficult circumstances.

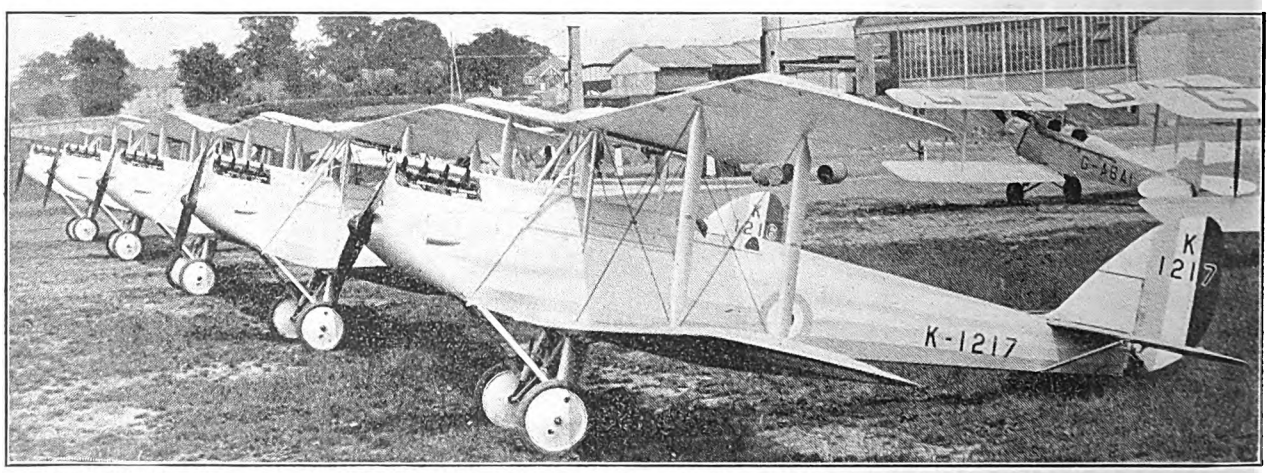
In November 1925 he was appointed to command No. 208 (Army Co-operation) Squadron at Ismailia. In November 1926 he was placed on the non-effective (sick) list. In May 1927 he was appointed to Headquarters, Inland Area, for Engineering Duties.

Tug-of-War Championships at Olympia.

The finals of the R.A.F. Tug-of-War Championships were held at Olympia during the last week of the Royal Tournament.

The R.A.F. Depot, Uxbridge, won the 110 stone beating Andover by two pulls to none. Calshot won the 130 stone beating Andover by two pulls to none.

In the Inter-Services Championships at 110 stone, the



INVERSION.—Five Service D.H. Moths (Gipsy engine) specially built for inverted flying and other aerobatics, ready for delivery to the Central Flying School, R.A.F. Three of these machines will do the C.F.S. inverted Moth formation at the R.A.F. Display on June 28.—(*"Aeroplane" photograph.*)

DO NOT FORGET THE R.A.F. DISPLAY ON JUNE 28.

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Royal Marines, H.M.S. *Rodney* beat Uxbridge by two pulls to none and at 130 stone the 2nd Batt. East Surrey Regt. beat Calshot by two pulls to none.

The Manston Garden Party.

Group-Captain R. C. M. Pink, C.B.E., and the Officers of the Royal Air Force Station, Manston, gave a Garden Party at Manston on June 14. The seven hundred guests, many of whom arrived by air, were received by Group-Captain and Mrs. Pink in the beautiful garden of the Mess and then roamed about the grounds and aerodrome or danced in the Mess ball-room as they felt inclined. The majority of them explored the aircraft parks before tea and danced afterwards. The various challenge cups, bowls, and trophies, testifying to the athletic prowess of the Station, were on view among the tea tables and were universally admired.

The aeroplanes, both those belonging to the Station and the visitors, were parked in two enclosures on the aerodrome, the Service machines in one and the civil machines in the other.

In the Service enclosure a number of different types could be inspected by the guests and an added interest was given to them by members of the Station *personnel* who stood by ready and anxious to answer all questions about the construction, functions and equipment of the machines. Many of the visitors had not seen Service aircraft at close quarters before and were intensely interested. The machines belonging to Manston were a Vickers Virginia of the new type with the rear gunner's cockpit in the tail, which is the equipment of No. 9 (Bomber) Squadron, and several Armstrong-Whitworth Atlas machines of No. 2 (Army Co-operation) Squadron. One cannot help commenting on the perfect condition of these machines all of which were in regular service with their Squadrons but looked, in their stainless glory, as if they had never done a day's work in their lives.

The visiting machines in the Service enclosure were three Avro Lynx training machines, two Bristol Fighters, three Armstrong-Whitworth Siskins, an Armstrong-Whitworth Atlas and a Service Moth. In this enclosure also was a tent containing an interesting exhibition of interrupter-gear, bomb-release gear, and radio-telephony and photographic apparatus. On the walls of the tent were a number of beautiful coloured enlargements of photographs taken from the air.

Tremendous excitment was caused at tea-time by the arrival, in formation, of three Vickers Victoria troop-carriers. All three alighted and one of them was added to the exhibition,—where a member of the British Gliding Association could be seen walking round it trying to calculate how many gliders could be made out of one Victoria. One was given to understand that these machines had flown over from Hendon where they are stationed while taking part in the Set Piece at the R.A.F. Display but that they are really attached to the Bomber Squadron at Manston until they join a Victoria Squadron overseas.

The civil visiting machines were parked in another part of the aerodrome with Squadron Leader Probyn's veteran Widgeon acting as their host. They included Lt.-Col. Strange's Hermes-Spartan, Mr. Jackaman's Gipsy-Moth, Sq. Ldr. Leslie's Gipsy-Moth, Mr. Thorne's Hermes-Avian, Mr. Shaw's Hermes-Moth, Mr. Brett's Cirrus-Moth, Mr. Windsor's Bluebird, Mr. Trost's Junkers-Junior, and Lt.-Col. Henderson's Hermes-Desoutter. Miss Spooner arrived later in her new Gipsy-Moth having had what she described as a spasm of mental aberration and landed at Shoreham. A Breda flew over low down but did not land.

The weather was disappointing in that low clouds and a cold, wet mist off the sea prevented some of the guests from arriving including one Very Important Guest, but it did not prevent those who did arrive from thoroughly enjoying a very delightful afternoon.

The R.A.F. Manston Station Band played in the garden during the afternoon and was very much appreciated.

The Manston Garden Party will undoubtedly set a fashion in a new form of entertainment of their friends by the R.A.F. In following the example other Stations would do well to examine the splendid organisation of the Manston Party, every detail of which helped to make it such a success.—C. M. MCA.

No. 56 Squadron Re-Union.

A re-union dinner of No. 56 (Fighter) Squadron, R.A.F. will be held at North Weald, Essex on Friday, July 18. Any officer who has served with this Squadron and who has not already received an invitation is invited to apply for particulars to the Officer Commanding, No. 56 (Fighter) Squadron, North Weald, Epping, Essex, who will arrange accommodation for the night if required.

The R.A.F. Swimming Championships.

The R.A.F. Swimming Championships will take place at the Cliftonville Open Baths, Margate, from 17.30 to 20.00 hours on July 23, 24, 25 and 26.

The majority of the railway companies in Great Britain have agreed to issue cheap tickets to competitors.

The R.A.F. Lawn Tennis Championships.

The R.A.F. Lawn Tennis Championships will be held at the All-England Lawn Tennis Club Ground, Church Road, Wimbledon, S.W.19, on July 21, 22, 23 and 24, and an extra day if the weather is bad.

The events will include (I) R.A.F. Singles Championship, (II) R.A.F. Doubles Championship, (III) Inter-Station Doubles Championship, (IV) R.A.F. Plate, (V) Veterans' Cup.

All applications for entry forms (which contain rules and conditions of play) should be made to Sq. Ldr. N. F. D. Buckeridge, Hon. Sec., R.A.F. Lawn Tennis Association, not later than July 1, 1930.

The Airmen's Lawn Tennis Championships will be held at Halton during the week beginning July 14. A cup for the Singles Championship, presented by the Rt. Hon. Sir Samuel Hoare, Bart., C.B.E., C.M.G., M.P., will be competed for. A replica of the cup will be given to the winner and a prize to the runner-up.

Other events will include (I) R.A.F. Plate, and (II) Inter-Section Doubles.

Entries for the Singles Championship must reach Flg. Off. L. V. Hirst, R.A.F., Halton Camp, Bucks, by July 9, but entries for the Doubles will be accepted during the Tournament.

Henlow Station Sports.

The annual sports of the R.A.F., Henlow, were held on June 11 in fine but dull weather. There were splendid entries for all events, and a fair number of spectators were in attendance. R. H. Thomas, the Olympic half-miler, sportingly rested from all events.

The Band of the R.A.F., Henlow, under Sjt. H. H. Ingram, played selections at intervals.

THE MANSTON GARDEN PARTY.—Some of the 700 hosts and guests at the Air Garden Party given by the R.A.F., Manston, having tea on the lawns in front of the Mess. —(*"Aeroplane" photograph.*)

DO NOT FORGET THE R.A.F. DISPLAY ON JUNE 28.

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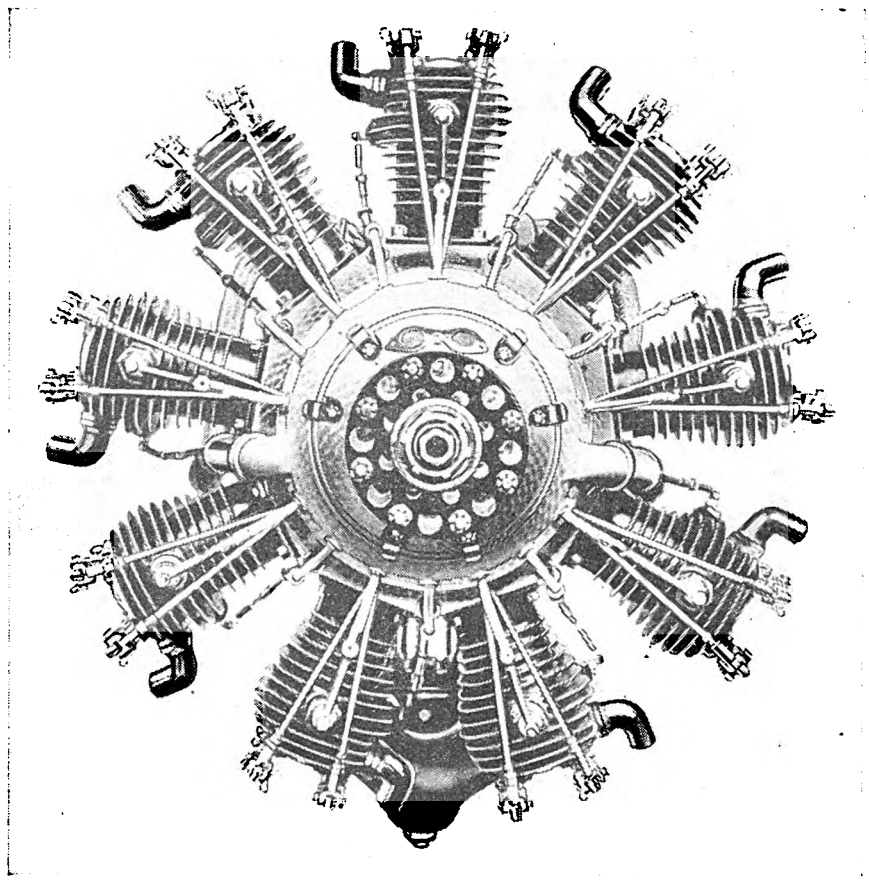

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The winners of the various events were:—

100 *Yards (Senior)*.—AC. Scoble (E.R.S.) (10 2-5 secs.). *Junior*.—Cpl. Proctor (Details) (10 4-5 secs.).

Putting-the-Shot (Senior).—AC. Ray (E.R.S.) (35 ft. 1 in.). *Junior*.—AC. Stevenson (A.R.S.) (32 ft. 6 in.).

880 *Yards Flat (Senior)*.—Cpl. Sanderson (A.R.S.) (2 mins. 12 secs.). (*Junior*).—AC. Roberts (E.R.S.) (2 mins. 28 secs.).

Tug-o'-War (Final).—E.R.S. beat A.R.S. by 2 pulls to 1.

220 *Yards Flat (Senior)*.—Cpl. Halls (E.R.S.) (23 3-5 secs).(*Junior*).—Cpl. Proctor (Details) (26 secs.).

High Jump (Senior).—AC. Norcott (H.Q.S.) (5 ft. 3 in.). (*Junior*).—Cpl. Snowden (Details) (5 ft. 2 in.).

1 *Mile Flat (Senior)*.—Cpl. Sanderson (A.R.S.) (5 mins. 11 3-5 secs.). (*Junior*).—AC. Hodder (E.R.S.) (5 mins. 15 secs.).

Inter-Section Relay (Senior).—E.R.S. (Cpl. Halls, AC. Childs, AC. Scoble, AC. Cooper) beat A.R.S. (*Junior*).—Details (AC. Jay, Plt. Off. Allen, Plt. Off. Cartmel, Cpl. Proctor) beat H.Q.S.

Officers' Race (Handicap).—Flt. Lt. Stafford (E.R.S.).

Long Jump (Senior).—AC. Norcott (H.Q.S.) (19 ft. 6½ in.). (*Junior*)—Cpl. Yule (E.R.S.) (18 ft.).

Obstacle Race.—AC. Blackmore (E.R.S.). *W.O.'s and Serjeants' Race*.—SM.1. Goddard and SM.2. Caulfield dead heat. *Javelin*.—Cpl. Eyles (H.Q.S.) (157 ft. 6 in.).

440 *Yards (Senior)*.—Cpl. Henley (Details) (55 3-5 secs.). (*Junior*).—Cpl. Proctor (Details) (1 min. 4-5 sec.).

Staff Derby.—H.Q. Section (Wing Cdr. Cooke, Flt. Lt. Hill, Cpl. Craven-Griffiths, AC. Luck). *Discus*.—AC. Ray (E.R.S.).

Three Miles (Senior).—AC. Hounsell (A.R.S.) (16 mins. 39 secs.).

120 *Yards Hurdles (Senior)*.—Cpl. Halls (E.R.S.) (17 3-5 secs.). (*Junior*).—Cpl. Snowden (Details) (20 secs.).

One Mile Walk.—Cpl. Sanderson (A.R.S.).

The Victor Ludorum Cup was secured by Cpl. Eyles, who put up a splendid performance in the field events, gaining 28 points. The runner-up was Cpl. Sanderson, with 26 points, all of which were gained on the track. The Wise Challenge Cup was won by Headquarters Section, with a total of 100 points, E.R.S. being runners-up with 76 points. The Donaldson-Hudson Cup for novices was won by E.R.S., with a total of 14 points; A.R.S. being second, with 12 points. In connection with the latter trophy, Details were easily ahead in athletics, but lost points in boxing, tug-o'-war and Rugby football.

The prizes were distributed by Mrs. Vere Bettington.—C. H.

THE BLACKBURN LINCOCK.

The front page of the cover this week shows the Blackburn Lincock (Armstrong Siddeley Lynx engine) which has already earned the admiration of everybody who has seen it. This machine is now being put on the market by the Blackburn Company for two distinct purposes. One is as a light high-speed single-seat fighter and the other is as a single-seat sports model for young men with money who can afford something rather special.

As a fighting machine it comes into a category which does not exist in the Royal Air Force, though it is one of the most popular types in the French *Armée de l'Air*. There this kind of machine is known as the "Type Jockey,"—and is regarded as having its own particular field of usefulness.

In this country we load up all our single-seat fighters with multiple guns, bomb-racks, night-flying gadgets, short range wireless, and all kinds of paraphernalia which taken together put such a load on the machine that something like 500 h.p. is necessary to take one fighting-man into the air. In France the "Type Jockey" with one gun and one man who is a real good shot and a real good pilot is regarded as being just as effective in a fight as a machine festooned with all these gadgets. Minus all the gadgets one man and one gun have just about the same performance with half the horse power, and consequently at about half the cost of the aeroplane and engine with the gadgets.

A Lincock has already been demonstrated in Canada with excellent results, and arrangements have been made to build all-metal Lincocks in Canada and to fit them with Canadian-built Lynx engines.

One of the most prominent sportsmen in American aviation told one the other day that he is firmly convinced that the Lincock will meet with a ready, if somewhat limited, market in the United States purely as a sports machine. And as a war-machine the Lincock can certainly be recommended to all foreign nations which are contented to have a force of real high speed single-seat fighting machines without all the load of accessories which are considered necessary in this country.—C. G. G.

A FRENCH MAIL AEROPLANE LOST.

A Latécoère monoplane, carrying the weekly mails and two passengers on the usual Buenos Aires—Rio de Janeiro stage of the *Compagnie Général Aéropostale* route, came down in the River Plate estuary two miles off Montevideo, on the morning of May 11. The pilot, M. Negrin, the French director of the company's South American section, M. Julien Prainville, the telegraphist, and a Brazilian passenger were lost with the machine and mails. One passenger, a Brazilian managed to swim ashore. The cause of the descent is not definitely known, but a heavy fog covered the region at the time, and the pilot may have lost his way and have been forced down by lack of fuel.

DUNKIRK to the DARDANELLES.

READY ON JUNE 21st.

Air Commodore C. R. SAMSON'S

PERSONAL REMINISCENCES
— OF THE WAR, 1914-18. —

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21/- AEROPLANE BOOK DEPT., **21/-**
Cannon House, Pilgrim St., E.C.4.
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A WELL-MEANT EFFORT.

[*The Aviation Year Book*, 1930. Edited by Charles E. Lee. x 246 pp. Fully illustrated. Sampson Low, Marston and Co., Ltd., 5s., and from THE AEROPLANE Book Department, Cannon House, Pilgrim Street, E.C.4.]

There is a great and growing need for an accurate handbook relating to the progress of civil aeronautics throughout the world,—apart from the Civil Aviation side of the Historical section of *All The World's Aircraft*. The main essential of such a book is that it should be precise, and the author must stand or fall by this test. The present volume is a courageous attempt to supply this need, but it would have been as well had this courage been tempered with an equally praiseworthy desire to be accurate. Time and again in its pages does one come up against irritating mistakes in names, initials, dates, addresses and so forth.

Yet it would be unfair to deny that the book will prove of use to those who are in need of that odd sort of information about aviation that is so often wanted. For example, a good deal of intelligence is shown about air lines, aerial clubs and institutions and aviation companies that will be of value to those engaged in the trade. In compiling this Mr. Lee must have found last year's issue of *All the World's Aircraft* very useful.

A word must be said about the illustrations. Authors so often confound pictures with illustrations. An illustration should really help towards the elucidation of the text. Unfortunately those in this book do not give that aid, and the reviewer considers that if Mr. Lee brings out another edition, he should be more selective.—G.

MISS JOHNSON'S FURTHUR PROGRESS.

On June 15 Miss Amy Johnson arrived at Canberra in a Hawk Moth piloted by Major Hereward de Havilland, after being held up by rain and mist for a day at Goulburn, and disappointing a large crowd which had waited at Canberra for two hours in very bad weather.

On the steps of the Parliament House, next day, Mr. Scullin, Prime Minister of the Commonwealth, welcomed her as follows:

"I welcome you because you have proved that women are the bravest of the brave, and I ask you to tell the people of your great country how much we admire your pluck and great endeavour. I wish you long life and prosperity."

Mrs. Scullin gave her an opal necklace on behalf of the women of Canberra.

Going on to Melbourne next day, escorted by Service and private aircraft, Miss Johnson was welcomed on the racecourse by 15,000 people and official dignitaries, and at a civic reception at the town hall Col. Brinsmead, Controller of Civil Aviation, presented to her a No. 1 Civil Air Pilot's Licence, the first ever granted to a woman in Australia.

THE DUETSCHE LUFT HANSA MEETING.

At a meeting of the Luft Hansa on June 5, at which 24,720,000 marks in shares were represented, Director Milch gave an outlook for 1930. Herr Milch related that in 1930 the rationalisation plan will be forwarded as proposed, the short-distance lines (up to 300 kilometres) have been diminished about 25% against 1929, and the middle distance lines (between 300 and 700 kilometres) about 10%. The big distance lines, however, have increased 20%. The reason is that in 1929 these long-range lines have been best frequented.

There will be new night-flying lines as follows: Hanover—Cologne—London, Hanover—Cologne—Paris, Berlin—Halle—Leipsig.

Also the lines from Germany to Scandinavia will be changed at once into night-flying lines.

The air-line net-work in Germany is improved by the elimination of several small German Airports. From 63 Airports in 1929 there have been only 52 used in 1930.—W. B.

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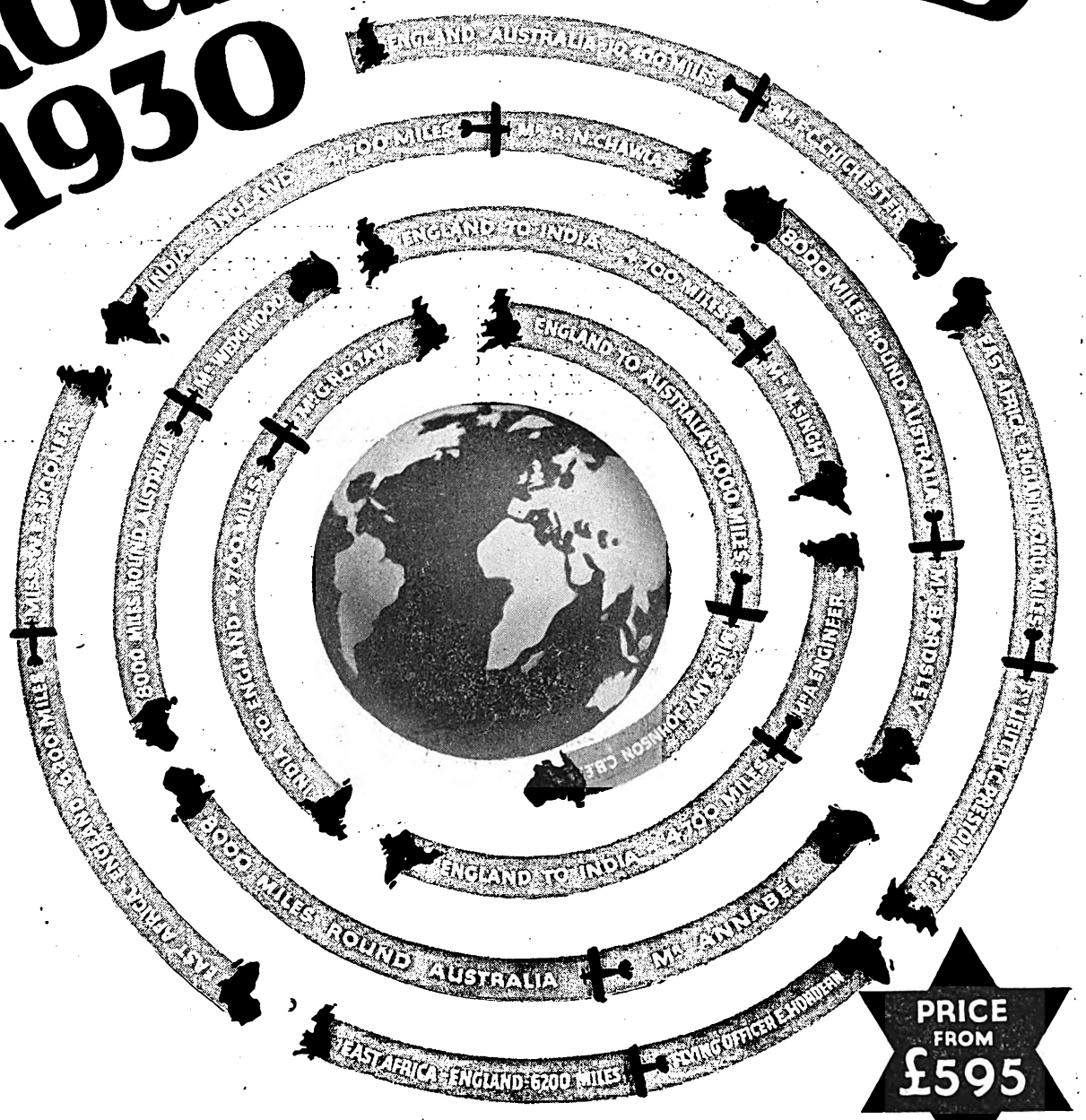
MOTH *long distance flights....* *already* 3½ TIMES ROUND *the* WORLD *in* 1930



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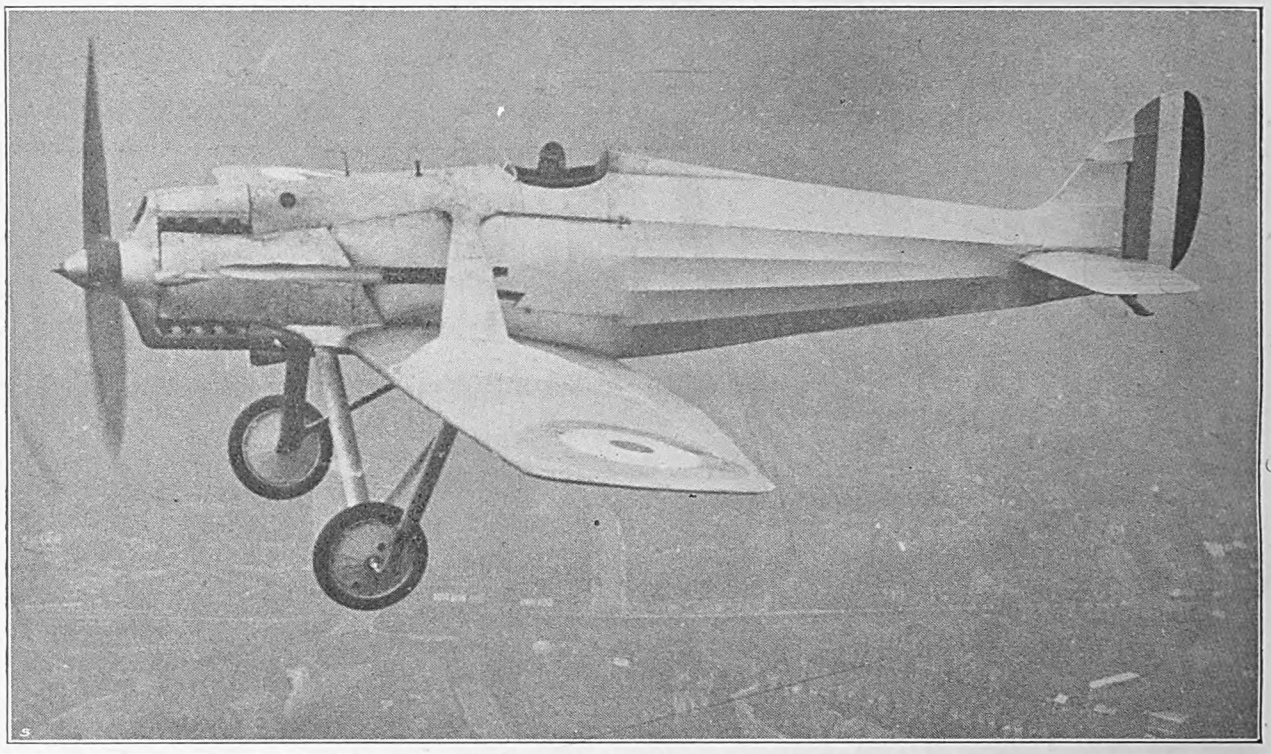
THE DE HAVILLAND INTERCEPTER.

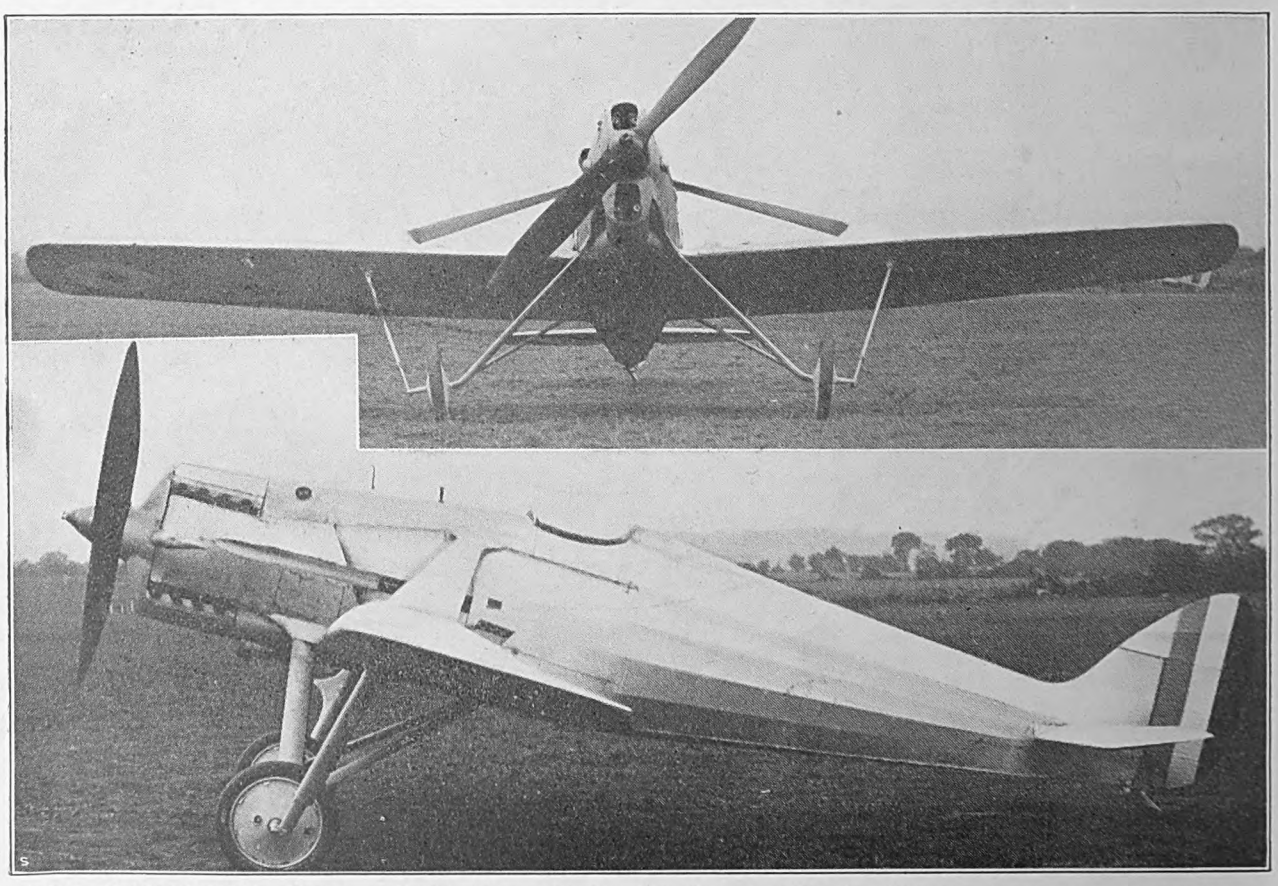


THE INTERCEPTER.—The newest De Havilland high-altitude fighter, with Napier "H" supercharged engine.
—(*"Aeroplane" photograph.*)

The first example of a quite new type of military aircraft is now completing its trials at the Aeroplane and Armament Experimental Establishment at Martlesham Health, Suffolk. This machine is a low-wing single-seat fighter of what is called the "intercepter" class, designed and built by The De Havilland Aircraft Co. Ltd. It is one of the fastest fighting aeroplanes in existence, and embodies new practices in certain features. There is no fixed tail-plane, the whole tail is the elevator. And the narrow engine gives the pilot an unusually good view forward and downward.

The engine, built by the Napier Company, to the designs of Major F. B. Halford, is especially noteworthy in that never before has an air-cooled unit of such power been produced which offers so little head resistance. The general idea of the engine may best be grasped if one visualises four Gipsy engines, two vertical and two inverted, side by side, with only two crank-shafts for the four (a vertical and an inverted to each shaft), both geared to a central air-screw shaft, which runs slower than do the engine shafts.

Further details cannot yet be divulged, but this unique



THE INTERCEPTER.—Front and side view, showing the absence of head-resistance.—(*"Aeroplane" photographs.*)

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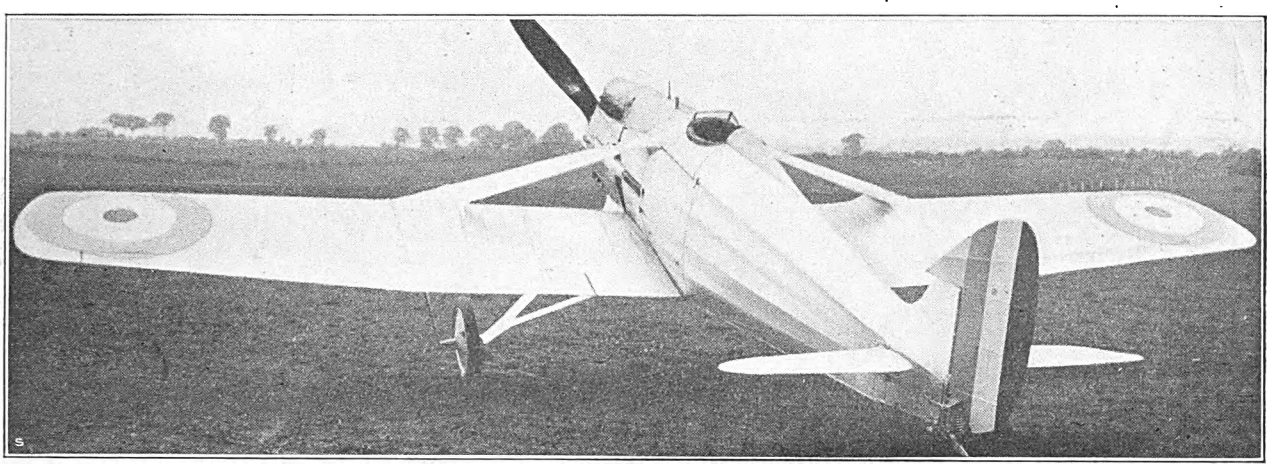


THE DE HAVILLAND INTERCEPTER.—Rear view of the new fighter. —(*"Aeroplane" photograph.*)

machine will be on view at the Royal Air Force Display on June 28.

Photographs may be bought from THE AEROPLANE, 175, Piccadilly, London, W.1.

Hereafter is a brief specification of the De Havilland-Napier Intercepter:—

Number of seats.—One.

Dimensions.—Span 32 ft. 2 in., Length 24 ft. 6 in., Height 7 ft. 6 in.

Total Weight.—2,300 lbs.

Undercarriage.—Rubber in compression.

Ailerons.—De Havilland patent differential control system.

Fuselage.—Duralumin tube with wooden formers, covered with fabric.

Wings.—Wood and metal.

Engine—Napier "H":—Built by D. Napier and Son Ltd. 16 cylinders arranged in 4 blocks of 4 cylinders each, vertically opposed. H formation. Air-cooled. Power,—approximately 300. Weight,—620 lbs. Super-charged.

NEW RECORDS.

The United States Bureau of Standards announced on June 9 that Lieut. Apollo Soucek, U.S.N., had established a new World's Record for Altitude on June 4. His barographs have been examined by the Bureau and his height officially conceded as 43,166 ft. or rather more than 1,000 ft. over the previous record established by Herr Willi Neuenhofer on a Junkers monoplane (Bristol Jupiter). The new record has yet to be homologated by the *Fédération Aéronautique Internationale.*

With the news that the World's Height Record of the Junkers has at last been beaten comes a list of new records in a different class now established by a Junkers Junior (Armstrong-Siddeley Genet-Major engine) on floats.

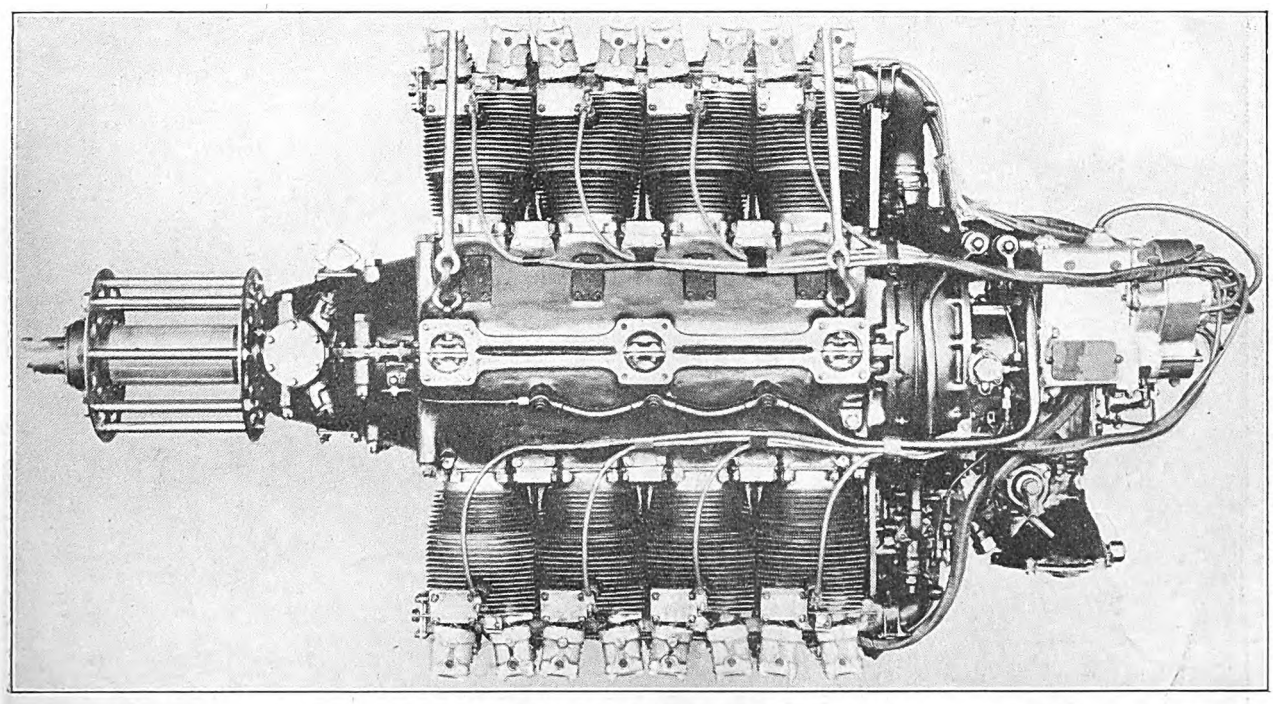
With pilot and passenger this smallest member of the Junkers family climbed to 4,700 metres (15,000 ft.). An endurance of 8½ hours was reached with the same load, a speed of 164 km.p.h. (102.5 m.p.h.) attained, and an actual distance of 1,080 km. (675 miles) was flown non-stop, of which 900 km. (562 miles) has been officially acknowledged.

With the pilot alone the Junkers Junior seaplane reached a height of 5,700 m. (18,500 ft.).

A MEDAL FOR DIEUDONNE COSTES.

The gold medal, awarded annually by the *Fédération Aéronautique Internationale* to the most distinguished aviator of the year, has been awarded to Dieudonné Costes, according to a dispatch from Paris on June 12. M. Costes, with Joseph Lebrix, made a magnificent flight across the South Atlantic and a considerable distance round South America and the United States. In 1929 and 1930 M. Costes broke seven World's Records, including that for the longest non-stop flight. He is now preparing for a flight from Paris to New York.

Among other famous and meritorious aviators who were considered for the award for 1929 were Dr. Hugo Eckener, Admiral R. E. Byrd, the Spanish airmen Jiminez and Iglesias, and Robert Kronfeld. Among those to whom the medal has been awarded in previous years are the Marchese Francesco de Pinedo, Sir Alan Cobham, Col. Charles A. Lindbergh and Sq. Ldr. Bert Hinkler.



NAPIER'S LATEST.—The "H" engine, designed by Major F. B. Halford and built by D. Napier and Son Ltd. The engine consists of four vertical blocks of four air-cooled cylinders each. The upright and inverted cylinders on each side work on a common crank-shaft, and the two crank-shafts are geared to one common airscrew shaft.

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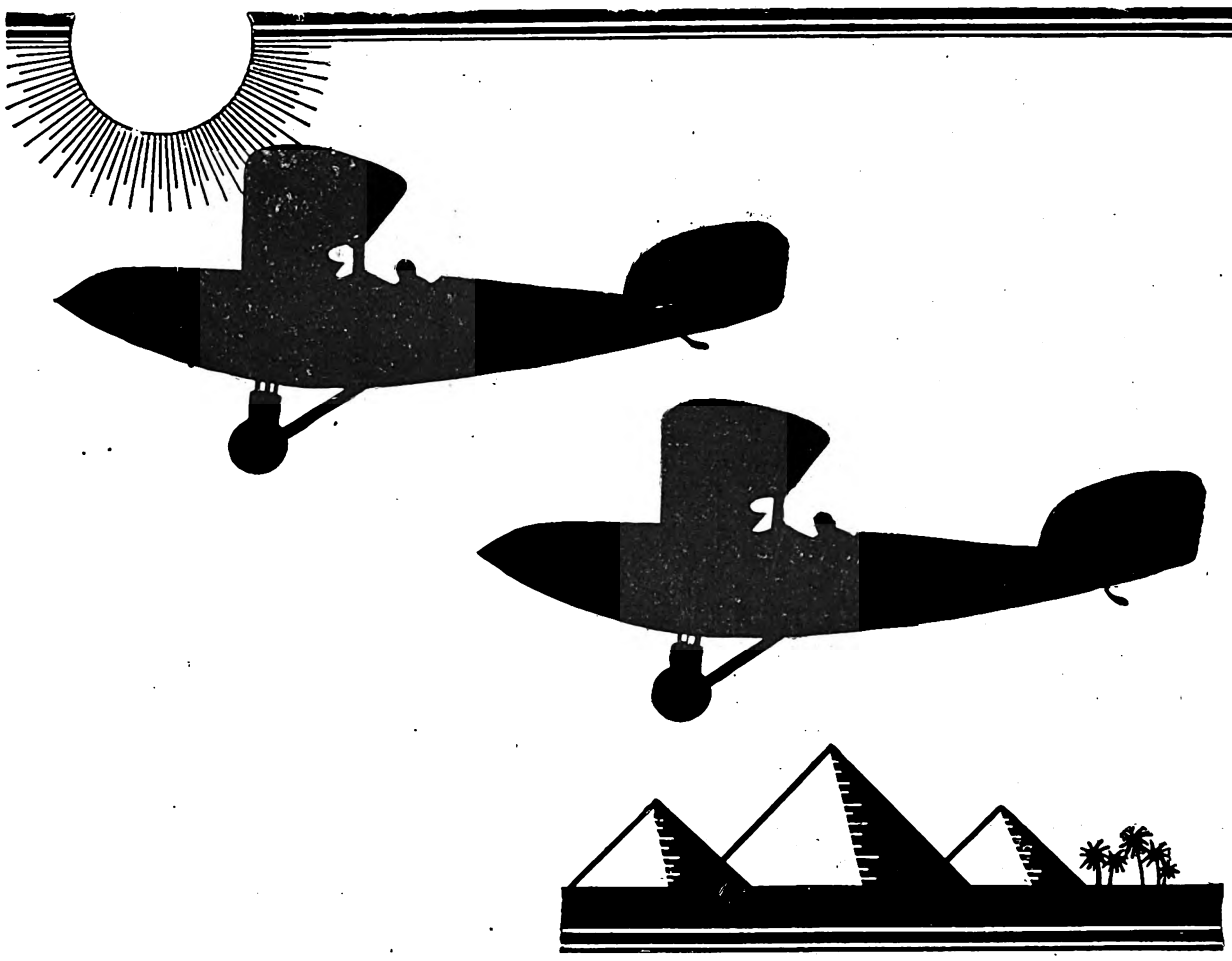

The elements in which they move are as real a potential danger to aircraft as engine trouble. The risk of blistering under a scorching sun is obviated when machines are doped with Cellon, which renders aircraft fabric proof against water, oil, petrol, and extremes of temperature. On all Fairey machines, which have themselves carried their fame all over the world, Cellon Dope is used for the fabric, while the metal structure is lacquered with Cerric.

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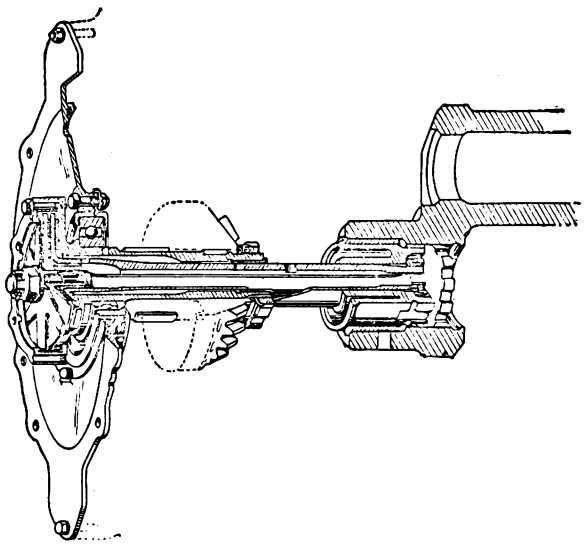

ADVANTAGES OF THE ROLLS-ROYCE 'F' AND 'H' ENGINES

(G)—Spring Drive to Auxiliary Mechanism

Shocks due to rapid acceleration or deceleration of the crankshaft are absorbed and damped by the Rolls-Royce spring drive, thus eliminating the possibility of damage being done to the camshaft gears or any of the auxiliary parts.

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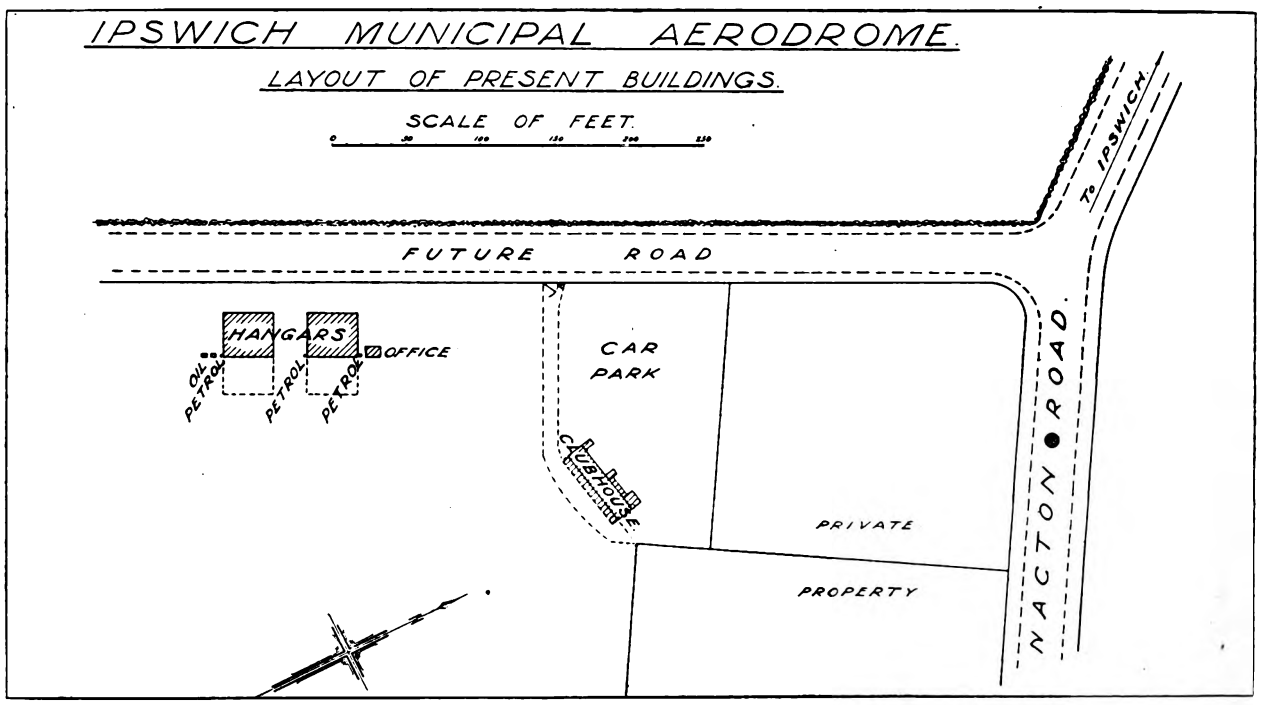


The Suffolk and Eastern Counties Aeroplane Club, who have taken a seven-years' lease, have arranged to move their headquarters to the Ipswich Municipal Aerodrome, and are going to act as managers on behalf of the Town Council.

A hangar capable of housing three light aeroplanes is now being built, to provide accommodation for the Club's 'planes. A similar one is being provided for the benefit of visiting aircraft.

The two hangars are located side by side with a space between them which will accommodate two more light aeroplanes with folded wings. By stretching a tarpaulin from one building to the other, a weather-proof emergency hangar is obtained.

Three outdoor petrol pumps and two oil cabinets will be installed immediately.

The Club-house belonging to the Suffolk and Eastern Counties Club is being re-erected on the site, and additional accommodation is being made for visiting pilots and passengers. A kitchen is being added so that refreshments can be provided.

A small office is also being built and fitted with a telephone.

The space at the rear of the Club-house will be paved with clinker and laid out as a car-park. There is ample space at the rear of the office and hangars to accommodate many more cars in case of emergency.

The whole site, all the buildings and fuel installations mentioned above, are the property of the Corporation, the Club paying a rental for their use.

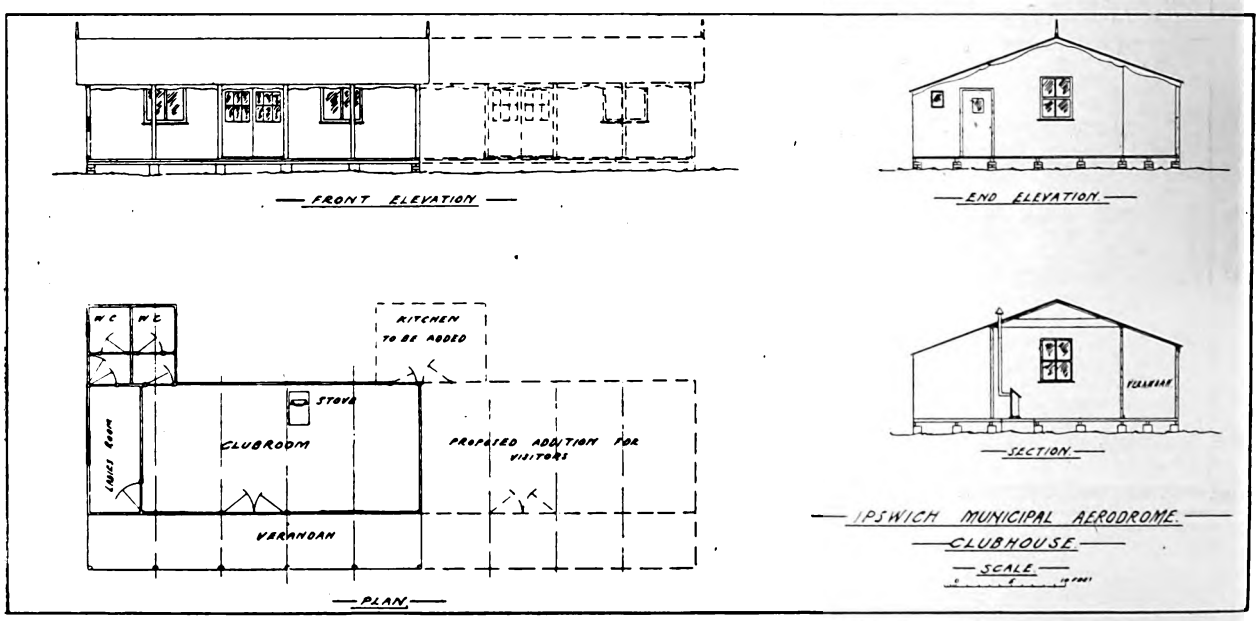
The Aerodrome will be officially opened on June 26, 1930, and it is expected that H.R.H. The Prince of Wales will perform the opening ceremony. The Club have arranged an excellent exhibition and display, which, they hope, will attract a host of aviators from other parts and a large crowd of spectators.

The advantages of the site are many, and there appears to be no reason why the Ipswich Aerodrome should not be one of the best in the country. As a landing ground it is splendid. It has long take-offs in every direction, and a very flat, even surface. The soil is so light that rain is absorbed immediately it falls, making it possible to walk anywhere after a wet day without getting one's shoes dirty.

Its position relative to the Town is ideal, being only two-and-a-half miles from the Town centre, and in direct road communication with Ipswich. A Corporation trackless tram service is within 360 yards of the Club-house, and a frequent 'bus service to the seaside resort of Felixstowe is within half-a-mile. Provision is made for new roads connecting almost directly with the Docks and works areas, and it is probable that the work of constructing them will be commenced within three years.

The Aerodrome is excellently situated as an airport, and as a distributing centre for all parts of this country. It is almost as near as it can be to Belgium, Germany and Holland, and the sea-crossing is only one hundred miles.

The site is entirely free from town-smoke, and is too high to suffer from river or sea mists, and the whole district



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FLY AS YOU DRIVE — SIDE-BY-SIDE!

"We shall be there soon, shan't we, Geoff?"

"Very soon now. Comfortable?"

"Marvellously, thanks. I've never enjoyed a flight so much. After all, the old double cockpit 'plane was rather too remote, don't you think? I mean so frightfully 'excuse-my-back' and so on!"

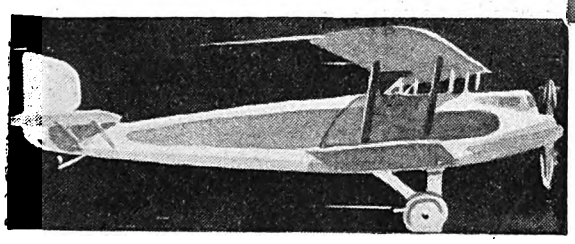
"Oh, terribly. Of course, it's only sane to sit together and talk. If in a car why not in a 'plane?"

"Exactly. It's very like a car, in fact."

"That was Blackburn's idea, I suppose. This Blackburn Bluebird, you see, has a locker for luggage, this side-by-side seating, self starting engine, all metal construction! And, my girl, twenty years' experience of aircraft building behind it."

"The only English 'plane like it. . .

"There is no other. Blackburn Bluebird is the one and only English 'plane built on these new lines. No doubt there will be others. But this one holds the lead."



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is remarkably free from rain and extreme weather conditions.

Until the volume of Air Traffic demands the use of the full site, the Council intends to shut off an area on the South-east for playing-fields. This will be done by putting up an easily-removable fence, and, as the whole area is sown with grass, it can be made available for aviation purposes in a very short time, and with a minimum of labour.

The intention is to build large permanent hangars and administration offices at a later date.

In conclusion, let me offer a few words of warning to those who are contemplating preparing aerodrome sites. If possible, work in the Summer and sow the grass seed in the Autumn. By preparing the ground during the Summer months, there is less likelihood of being held up by bad weather, the sun will help considerably in killing off weeds, and rubbish can be burned very much more easily.

If tractors are used for cultivating purposes, let them be as light as possible when the rolling stages are reached. Otherwise, the weight on the tractor wheels will cause ruts which are not easily rolled out.

THE AIRSHIPS.

In the House of Commons on June 4, in reply to a question by Lieut. Cdr. Kenworthy, the Under-Secretary of State for Air said that the new airship contract was not for the elaboration of a complete new airship design but for the employment of a technical staff partly to investigate possible detail improvements in the design of R.100 and partly to discover what improvements and modifications to the R.100 type of airship would be necessary if it were decided to build an airship of capacity greater than five million cubic feet. There was a limit of £2,000 a month to the payments under the contract; expenditure to date had been £7,800. No Supplementary Estimate would be involved.

Replying to a question by Mr. L. Smith, Mr. Montague said that the delay in the departure of the R.100 for Canada was not due to the mooring mast in Canada not being suitable. The postponement of the flight to Canada was entirely due to the failure of the tail fairing piece of the R.100.

Replying to Mr. L'Estrange Malone, Mr. Montague said that the Air Ministry hoped that R.100 would be ready for her flight to Canada towards the end of June or the beginning of July. While her sister ship was in Canada R.101 would do some experimental flying in this country and would then be put back in her shed for the insertion of the extra bay. When the extra bay had been installed, R.101 would undertake her experimental flight to India.

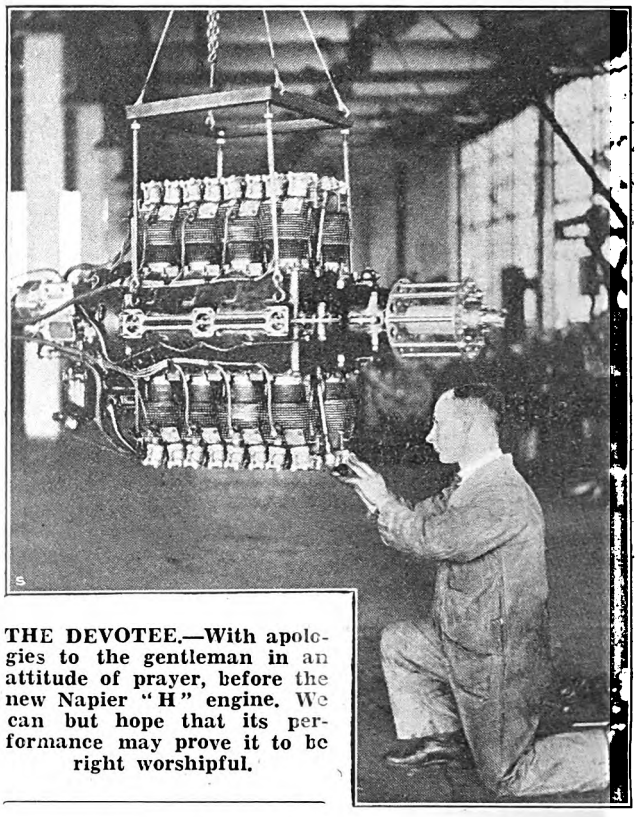
THE R.100'S VISIT TO CANADA.

The Air Ministry has advised the Canadian Air authorities that the R.100 will not now visit Canada until the end of July, after the Dominion elections for which the poll is on July 28. The start will probably be made sometime during the last three days of the month.

The visit of the airship is looked forward to by Canada, which intends to celebrate it with a kind of great Empire Festival. The Dominion Government has spent over £50,000 on the erection of a mooring mast at St. Hubert aerodrome, some 14 miles from Montreal. It is 208 feet high and has accommodation at the 100 ft. level for waiting rooms, Customs and a restaurant. These facilities will not be provided on a regular scale unless a passenger service is in operation, but temporary arrangements are being made for the initial visit. The winches and lifts in the St. Hubert mast are electrically operated.

A particularly large influx of American tourists is expected in the event of the airship's arrival and two emergency hospitals have been put up near the aerodrome to deal with motor accidents or other mishap among the 100,000 people who are expected.

St. Hubert is now the headquarters of three Canadian commercial companies and is being equipped with very full facilities. One of three macadam runways recently laid down is a mile and a half in length. All will hope that there will be by then at least *one* decent macadam road to the aerodrome, so that there may be no repetition of the jam which happened when an air display was held at St. Hubert last year.



THE DEVOTEE.—With apologies to the gentleman in an attitude of prayer, before the new Napier "H" engine. We can but hope that its performance may prove it to be right worshipful.

THE MAKING OF AN AERODROME.—One of the tractors used by the Corporation in making the Ipswich Aerodrome.

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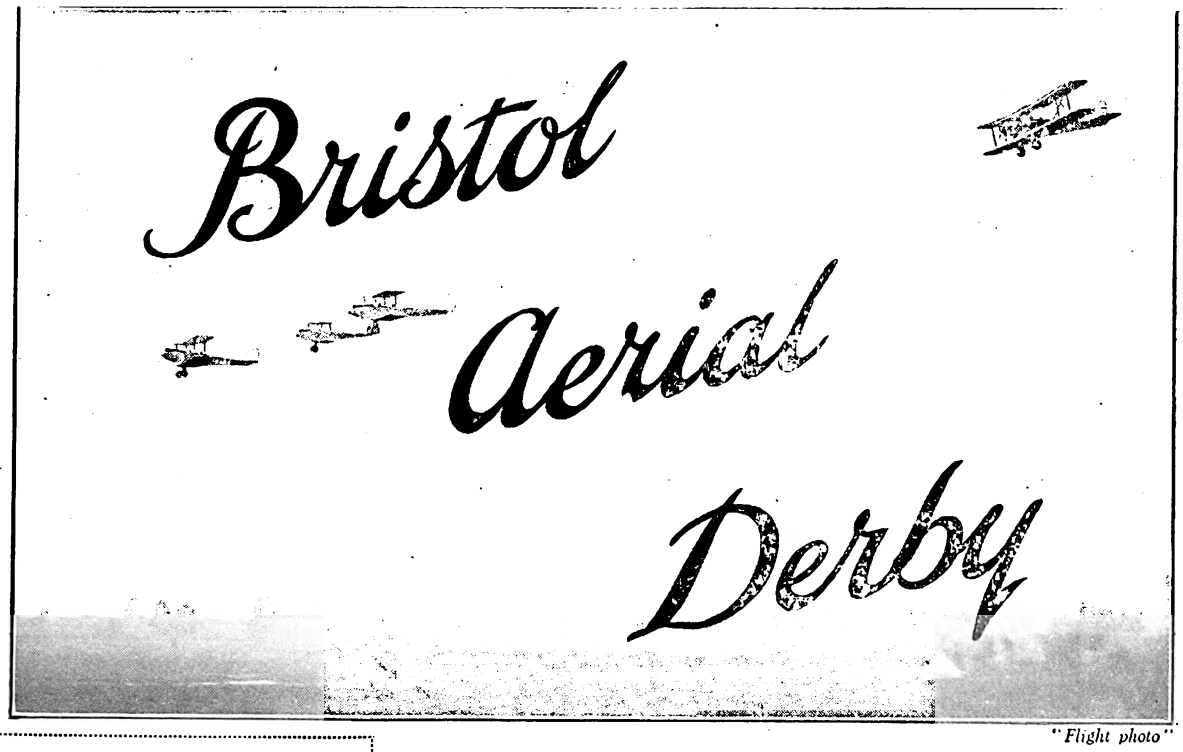

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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

THE DESOUTTER SPORTS COUPE MARK II.

A new version of the Desoutter three-seat cabin monoplane, which is already World-famous, has been put into production and will be known as the Desoutter Sports Coupé Mark II. One of these Mk. II machines has been entered for the King's Cup Race and will be actually the first machine of the new type to be completed. As Mr. Marcel Desoutter says, this is only coincidence, as any other Mk. II machine would stand an equal chance. The machine that will be flown in the King's Cup Race will in no way differ from the standard production model and will have no special racing modifications. Any apparent streamlining which looks too good to be true, on investigation will prove to be standard.

The Desoutter Sports Coupé has earned a name for itself as an ideal taxi machine of the light type, and one of the features which has helped the machine to this enviable reputation is the combination of comfort with a high cruising speed. Another feature of special appeal is the low cost of maintaining a cantilever wing which is covered with plywood. This method of wing construction has definitely proved its worth through years of service.

Perhaps one should outline the modifications which turn a Mark I into a Mark II before one gives a detailed description of the new type.

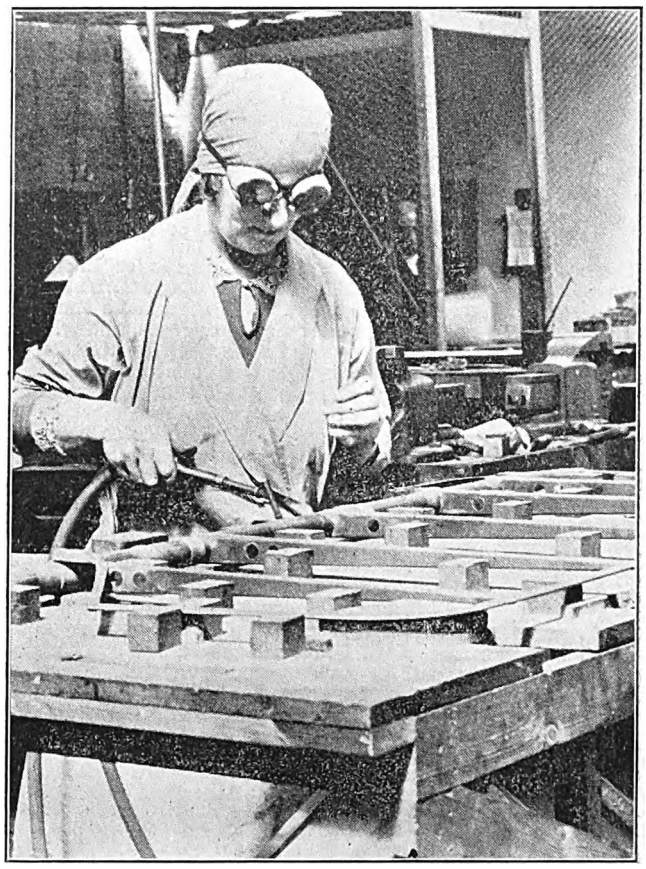
The first outstanding alteration is the fitting of an inverted engine. The first machine is to have a D.H. Gipsy III, though the choice of a power plant is left to the fancy of a customer. The fitting of an inverted engine raises the thrust-line and allows the machine to be brought nearer the ground. It also makes possible a narrowing of the nose, which in turn allows a modification of the windscreen. This has been raked forward considerably and given a much greater depth.

The fuselage forward of the cabin has been narrowed so that the pilot by inclining his head to one side or the other can see straight ahead on that side when the tail is down, quite apart from the improved view forward, which is due to having an inverted engine.

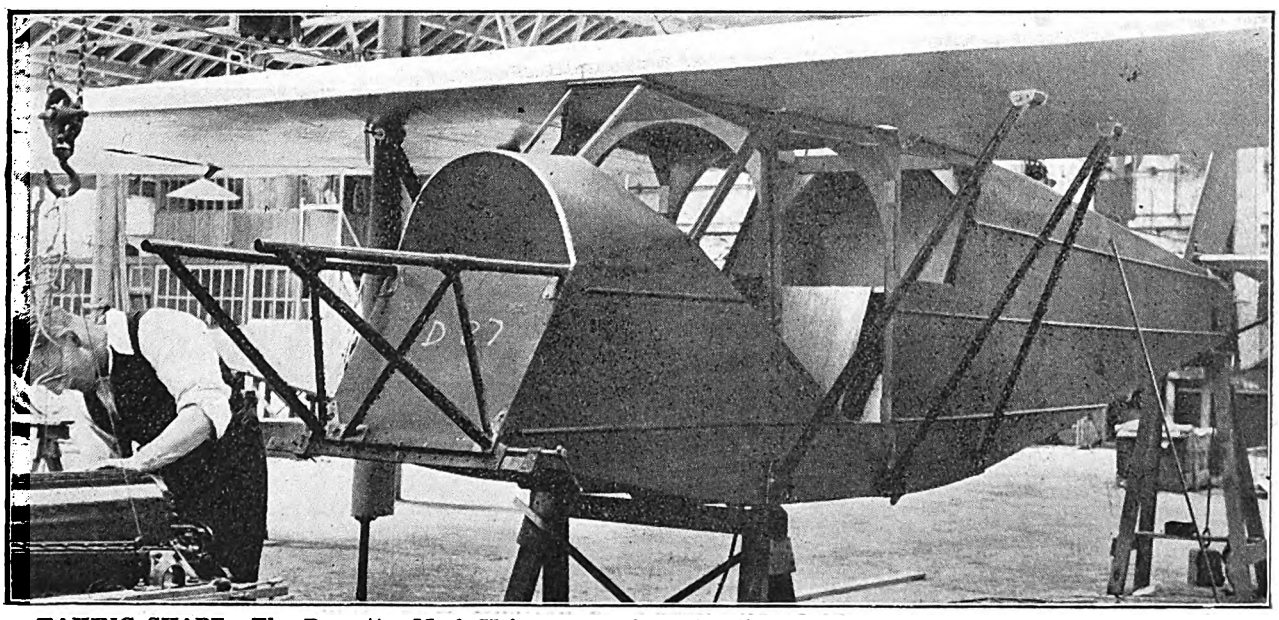
Another modification is in the design of the fuselage about the cabin, where the structure has been strengthened. One result of this is that the letting-in of glazed panels into the sides of the cabin in front of the pilot's seat has been made possible. These panels also improve the visibility. The combined ceiling light and emergency exit has been altered and considerably enlarged, with the result that the pilot by turning his head can see over the tail—a feature which people much appreciate in these days of crowded air-ways.

To meet the finer lines of the nose the fuselage lines have been brought together slightly. This is forward of the passengers' seats, with the result that their comfort is in no way decreased. In another direction an addition has been made to their comfort. The floor has been raised by three inches; this gives a much more comfortable angle to the passengers' legs. The height from the seat to the roof remains the same, so that the effective height of the cabin and feeling of spaciousness which such height gives are in no way affected.

As already mentioned, the structure of the fuselage about the cabin has been strengthened, and that for the passengers' benefit, for as the recently increased Certificate of Airworthiness has shown the Desoutter Sports Coupé Mk. I is amply strong enough. This alteration has been made to allow the installation of two doors, so that in the Mk. II



THE FEMININE TOUCH.—A woman worker welding a Desoutter tail-plane.



TAKING SHAPE.—The Desoutter Mark II in course of construction. At the bottom left-hand corner of the picture is the inverted Gipsy III about to be slung onto the bearers.

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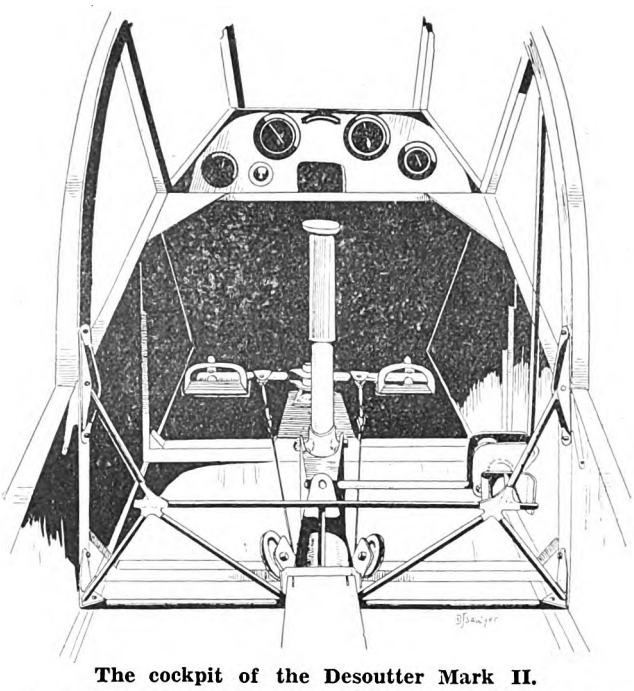


The cockpit of the Desoutter Mark II.

there is a large door on either side of the cabin. These doors are even bigger than the door on the Mk. I machine. One supposes that cabin aircraft will soon have the exaggerated doors now so frequently seen on cars to-day.

The ailerons have been slightly modified by a reduction of chord at their root, which makes the ailerons parallel for the whole of their span. The effect of this modification is to make them somewhat lighter in use.

The undercarriage has been modified so as to bring the machine some four inches nearer the ground, and Palmer wheel brakes have been fitted.

A few alterations have been made to the tail unit. The fin has been made triangular in side elevation, and the balance has been cut off the rudder. The tail-plane has been made to be adjustable while flying and is operated in the conventional way from the cockpit.

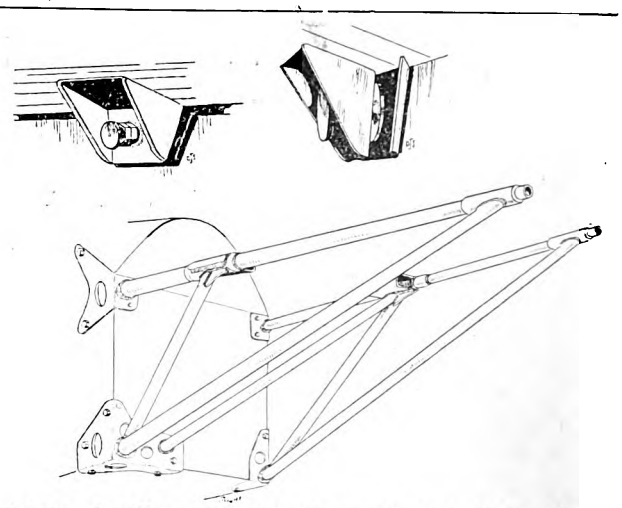
GENERAL DESCRIPTION.

Now that attention has been drawn to the various modifications that turn a Mark I into a Mark II, the machine will be described in detail. As a year has elapsed since full particulars of the Mark I machine were given in THE AEROPLANE, new readers will need a full description, and old readers will need their memories jogging.

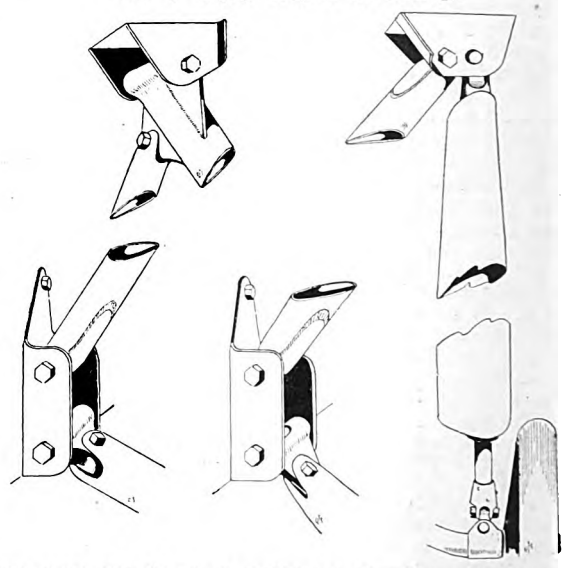
The Desoutter Sports Coupé Mark II is a three-seat high-wing cabin monoplane equally suited for private flying or taxi work. One of these machines is in regular use by Mr. Wilson for Press work such as the transference of important press pictures, or news and the getting of photographs in a hurry.

The wing is a cantilever and in one piece although the method of attaching it to the fuselage gives one the impression that the wing is more or less braced. In point of fact the wing is only positioned on top of the fuselage and the work is done by the struts on either side, which take the load to the base of the fuselage and the lower longerons.

These struts are of streamlined steel tube and there are three on each side. A single strut on each side runs down to the bottom of the fuselage. But from the rear spar there are two struts on each side, and these are arranged in the form of an inverted Vee with the apex attached to the spar.



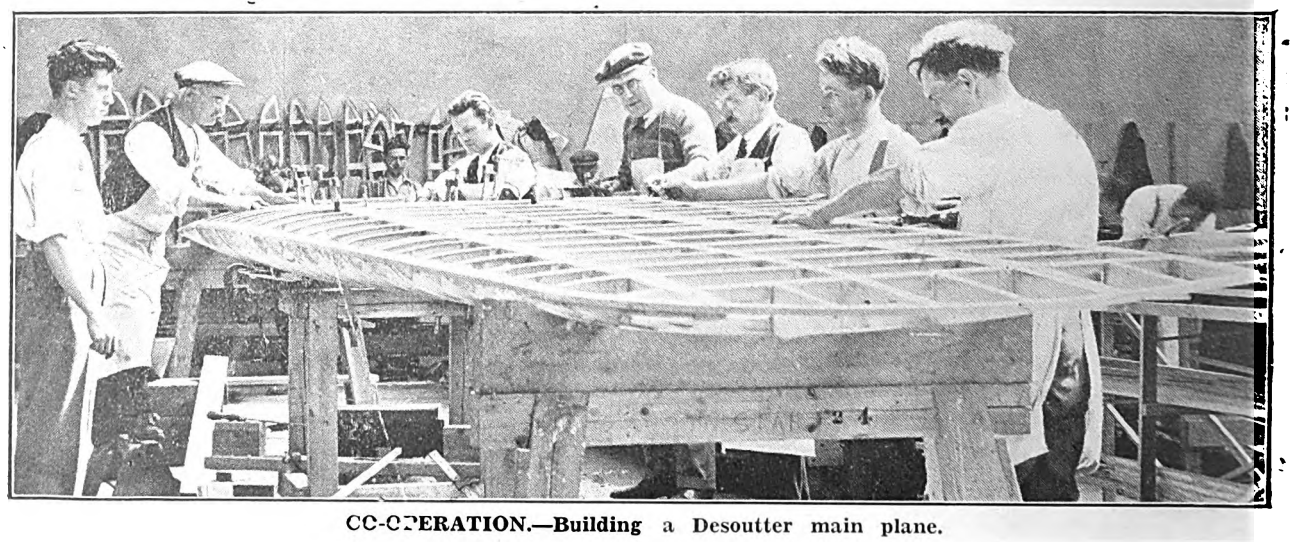
Above, location plate on the rear spar main plane. Below, Gipsy engine mounting.



Top, rear and front strut-fittings showing attachments of drag and compression struts. Bottom, fittings to fuselage showing attachment of main plane struts and undercarriage. Bottom of compression strut showing attachment to axle.

The wing section is a modification of Göttingen 387, and the wing is tapered in chord and thickness. Its structure is simple and of a type which for a time was not regarded with much favour in this country. Now there is quite a fashion for it. There are two box spars, with laminations of spruce and suitable stiffening pieces to take the various fittings. The webs are of ply-wood which varies in thickness from 2 to 6 mm.

The ribs are of spruce. At intervals they are boxed to give additional strength. Longitudinal stringers are fixed to the ribs, parallel to the spars. To these stringers and the ribs are attached the panels



CO-OPERATION.—Building a Desoutter main plane.

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SOUTHAMPTON

SEE FAMOUS AIRCRAFT

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AT THE

R.A.F. DISPLAY, HENDON, JUNE 28th, 1930

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VICKERS "VIMY."

THE FIRST TRANSATLANTIC FLIGHT WAS ACCOMPLISHED ON A "VIMY."

SUPERMARINE "SOUTHAMPTON."

FOUR "SOUTHAMPTONS" WERE USED ON THE R.A.F. FAR EAST FORMATION FLIGHT OF 27,000 MILES.

IN THE NEW TYPE AIRCRAFT PARK

VICKERS

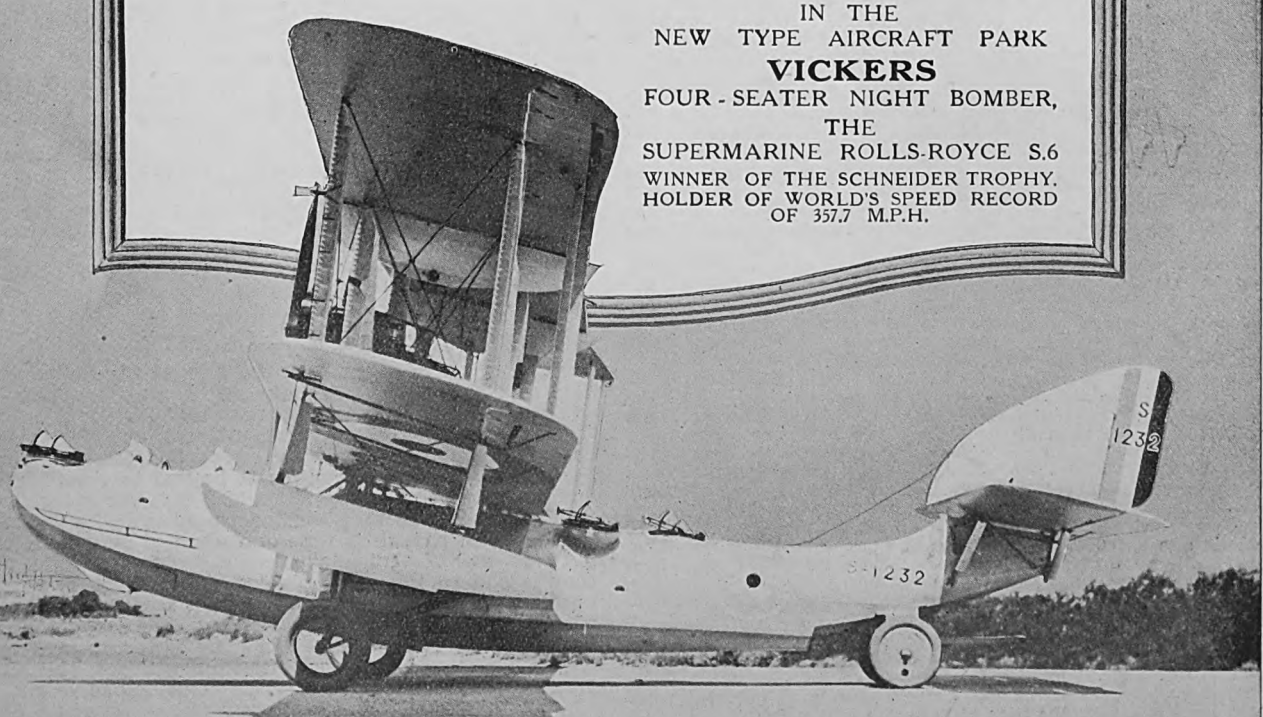
FOUR-SEATER NIGHT BOMBER,

THE

SUPERMARINE ROLLS-ROYCE S.6

WINNER OF THE SCHNEIDER TROPHY.

HOLDER OF WORLD'S SPEED RECORD OF 357.7 M.P.H.



Service Type Metal Constructed "Southampton."

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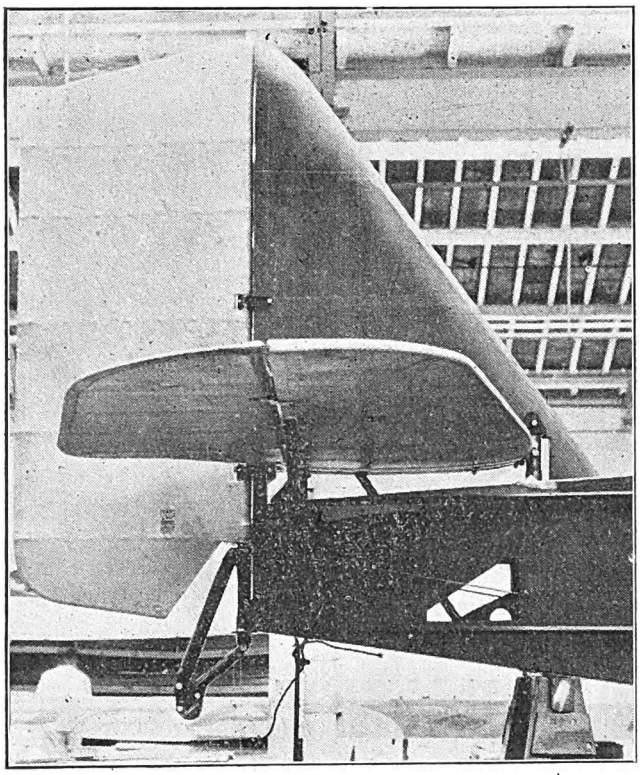


The tail unit of the Desoutter Coupé Mk. II.

of ply-wood covering which is 1 mm. thick. This is pinned in position and the joints covered with glued tape. There is no drag-bracing as all the drags loads are taken by the ribs and ply-wood skin.

The ailerons are built much the same as the wing. They are hinged along their top edge to the wing and are operated by push-pull rods which in turn are jointed to arms rigidly bolted to sprockets. These sprockets are in the same plane as the wing section and have their axes parallel to the spars. Thus by rotating the sprockets one gets the necessary movement on the ailerons.

The fuselage is an all-wood structure with a number of frames and four spruce longerons. The frames aft of the cabin are made of spruce members and have ply-wood gussets across the corners.

In the region of the cabin the frames are heavier and the lower longerons are considerably strengthened, for to these are attached the struts which take most of the load from the wings. The bulkhead or frame beneath the front spar has been modified and strengthened with various steel-tube members across the fuselage. Diagonal bracing members run from the lower longeron at the point of attachment of the front legs of the rear bracing Vee to the top of the fire-proof bulkhead. They cross the foot of the door frame. This diagonal meets a downward steel tube on each side which also forms the side of the new windscreen.

Forward from the cabin the frames are rigidly braced with struts. The whole of the structure of the fuselage is covered with ply-wood. On each side of the cabin and between what one might call the main spar-frames, seeing that they are under the two spars, are the two doors.

There are large windows in the fuselage aft of each door and in each door there is also a large glazed space. The windscreen has beneath it on each side glazed panels which are let in between the diagonal member and the steel tubes mentioned above.

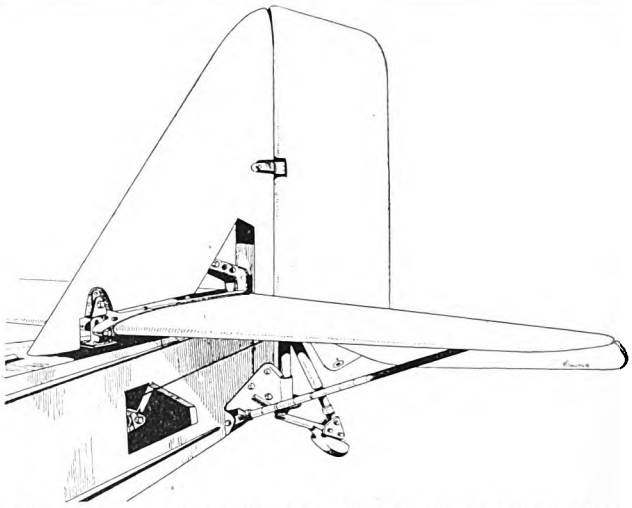
The tail unit is of the monoplane type with a strut-braced tail-plane and unbraced fin. The fin is now triangular in side elevation and is held at its leading edge in a fork on a tube. Inside this tube is the rising and falling member of the tail-raising gear. The rear fin post to which the rudder is attached is made of wood and extends down the stern of the fuselage to which it is screwed.

The tail plane is built in the same sort of way as the wing and is covered with ply-wood. It is attached at four points to the fuselage. The rear spar is hinged to a welded fitting at the stern-post. There are two struts of stream-lined steel tube which are hinged to the rear spar and run down to the base of the fuselage. The leading edge is attached through slots in the fin post to a rising and faling sleeve within it. This sleeve, which has a multi-start thread, is screwed up and down in the conventional fashion by a sprocket which is moved by a chain and cables from the front cockpit.

The rudder, which is made of welded steel tube, has been modified to the extent of having the balance taken off. The elevators are also made of welded steel tube and are worked by a push-pull rod which runs down into the fuselage and is attached to a lever. This lever is double-ended and from it wires run straight forward to a similar lever at the back of the cabin on the floor.

The undercarriage is of the wide track divided type which ensures adequate stability on the ground. The axles and radius rods of steel tube are arranged as Vees with their bases hinged to the side of the fuselage. The shock-absorber legs run from the apices of these Vees to the wings at the points to which the front wing bracing struts are secured. The wheels have Palmer wheel. brakes. A tracking tail-skid is hinged to the stern-post. This has a compression-spring.

The inverted Gipsy engine is supported on a simple steel-tube



The tail-plane, fin and rudder, showing the tail-trimming gear.

bearer with welded joints. Immediately behind this is the fire-proof bulkhead. A 25-gallon petrol tank is carried in the centre-section. This tank is made of tinned steel and carries enough fuel for a range at cruising speed of 4½ hours. This big tank, which can, if required by the customer, be increased to a larger size of 33 gallons, fits snugly into the wing and scarcely affects the stream-line. The feed is by gravity. Arrangement is made for the rapid shutting off of the fuel supply in emergency. The throttle-control is on the left of the cabin and works through push-pull rods.

The accommodation of the Desoutter Sports Coupé still retains all those features which have made such an impression. The pilot sits well forward and with the new windscreen and enlarged roof-light has a really good view. Behind him and at the full width of the machine are the two passengers' seats of a comfortable bucket type. To make for ease of access to these the pilot's seat is hinged and can be moved out of the way.

The large doors, the attractive interior finish and the scheme of upholstery, coupled with the fact that the control wires and rods are all in a conduit under the floor, combine to give an impression of motor-car comfort. There is a large luggage locker built into the fuselage above the backs of the seats, as well as the space at the back of the seats.

The controls are of the normal type. The rudder-bar has pedals which can be quickly adjusted to meet individual requirements. The wires are led round two pulleys beneath the pilot and pass through the conduit to the rear of the machine. The fore and aft movement of the control-column for moving the elevators is transmitted by a push-pull rod which also passes through the conduit and is attached to the double-ended lever to which wires from the elevator controls at the rear end of the machine are coupled.

The rocking movement for the aileron control is taken from the control column to a lever at the side of the cockpit, whence a push-pull rod transmits it to a lever in the wings, whence wires run to the chains and sprockets just forward of the ailerons.

The usual range of instruments is neatly grouped in a triangular board at the base of the windscreen, in full view of the pilot.

The dimensions of the Mark II are practically the same as the Mark I, the fuselage is nearer the ground and that reduces the overall height. The span of 36 feet (11 m.), the chord of 5 ft. 9 in. (1.755 m.), and the wing area of 190 sq. ft. (17.7 sq. m.) remain unchanged. As with the Mark I the Certificate of Airworthiness will be for 1,900 lbs. (863 kgs.).

THE HALDON RALLYE.

On Saturday next, June 21, the Annual Air Rallye will be held at Haldon Aerodrome, Devon. A most ambitious programme is planned, of which the chief item is the Rallye Competition for the really magnificent cup presented by the residents of Teignmouth and called the Teignmouth Air Trophy. The competition is limited to amateur pilots and is really a reliability test which involves flying a compass course and keeping constant speed over the ground.

Pilots must wire their time and place of departure, which must be over 100 miles away ,and declare the time which they intend to take over the journey. There is a highly scientific formula to decide which pilot shall get the Trophy, but the competition is just another example of the gradually increased stress which is being placed on useful flying by the devisers of contests. The runner-up gets the Millbay Cup, and both trophies are to be held for one year.

The expected variety of aircraft is characteristic of this year, when variety has been the key-note, and the pilots whose names appear in the programme are quite enough guarantee of the quality of show to be expected.

THE KING'S CUP RACE.

For the benefit of competitors using Armstrong Siddeley engines specially trained mechanics will be available at the London, Bristol, Manchester, Newcastle and Hull controls.

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WESTLAND

The Westland Works uphold the pioneering tradition of the West Country . . . Wings that first took the air over the lanes of Somerset are carrying the reputation of Westland across African veldt and Australian plains . . . . . Wherever the Air Forces of the Empire operate there the Westland Wapiti is to be found.

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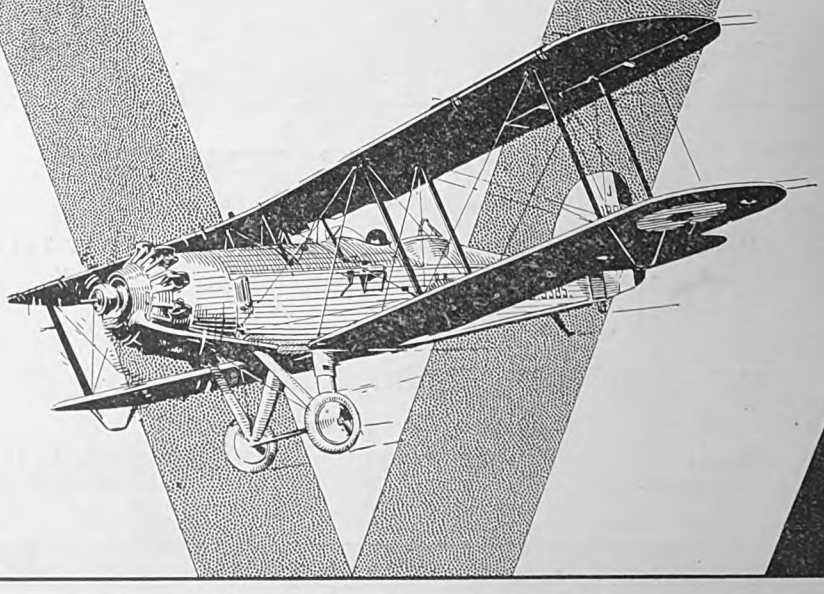

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

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COMMERCIAL AERONAUTICS.

THE NEW GLOSTER POLICY.

For something like twelve years everybody who has taken any interest in the Sport of flying, as distinct from mere Commerce or mere Militarism, must have been filled with admiration at the gallant way in which the Gloster Aircraft Co. Ltd., or to give it its earlier title the Gloucester Aircraft Co. Ltd., has stuck to the sporting side of flying. The money which the firm spent in building challengers for the Gordon-Bennett Cup and Deutsch Cup contests abroad, and for Aerial Derbys and King's Cup races at home must amount to a goodly sum, apart from the business they have lost by not concentrating on Air Ministry contracts and on commercial aviation. And Air Ministry orders for Schneider Trophy contestants simply mean money lost. So our admiration for the firm's enterprise in the past should be all the greater.

Therefore many will regret to hear that the Directors of the firm have definitely decided to have nothing more to do with sporting flying but to devote their energies and and their magnificent factory to the more profitable if more sordid purposes of commercial aircraft construction. This, be it noted, is not necessarily the construction of commercial aircraft, though undoubtedly building commercial aircraft will in time be much better business than building war-machines, simply because there will be far more civil aircraft in use than military.

What the decision really means is that instead of spending practically the whole time and energy of the design staff, headed by Mr. H. P. Folland, the firm's chief engineer, on fining and re-fining Schneider Trophy racers, the firm will turn that same energy onto producing the kinds of aircraft which are needed by the Royal Air Force and by the Air Services of foreign nations, and they will also give proper attention to the development of civil aircraft.

The Gloster VI, in spite of defective carburation which was no fault of the firm's, proved that where speed is concerned the Gloster Company have nothing to learn from anybody else. The Gloster Survey biplane which, with its two geared Jupitor engines, has done such excellent flying in the hands of the Aircraft Operating Co. Ltd., has proved that the Gloster Company is equally capable of building genuine commercial aircraft.

By way of still further commercialising the output of Gloster aircraft the Directors have decided definitely that all their aircraft in future shall be built of metal. They are committed rather to steel than to aluminium, but at any rate they have finished with wood. As a result they have moved the whole of their manufacturing organisation from the old Gloster works in Cheltenham, where they were alongside the famous factory of H. H. Martin and Co., which was the original parent of the Gloster Co., and are now doing all their work at Brockworth.

The move has been quite simple because for some considerable time, since the Gloster Co. took over the Steel Wing Co. Ltd., all the steel work has been done at Brockworth. So all that was necessary was to bring the last of the machine-tools and the office staff from Cheltenham to Brockworth and merely leave the whole of the woodworking department behind.

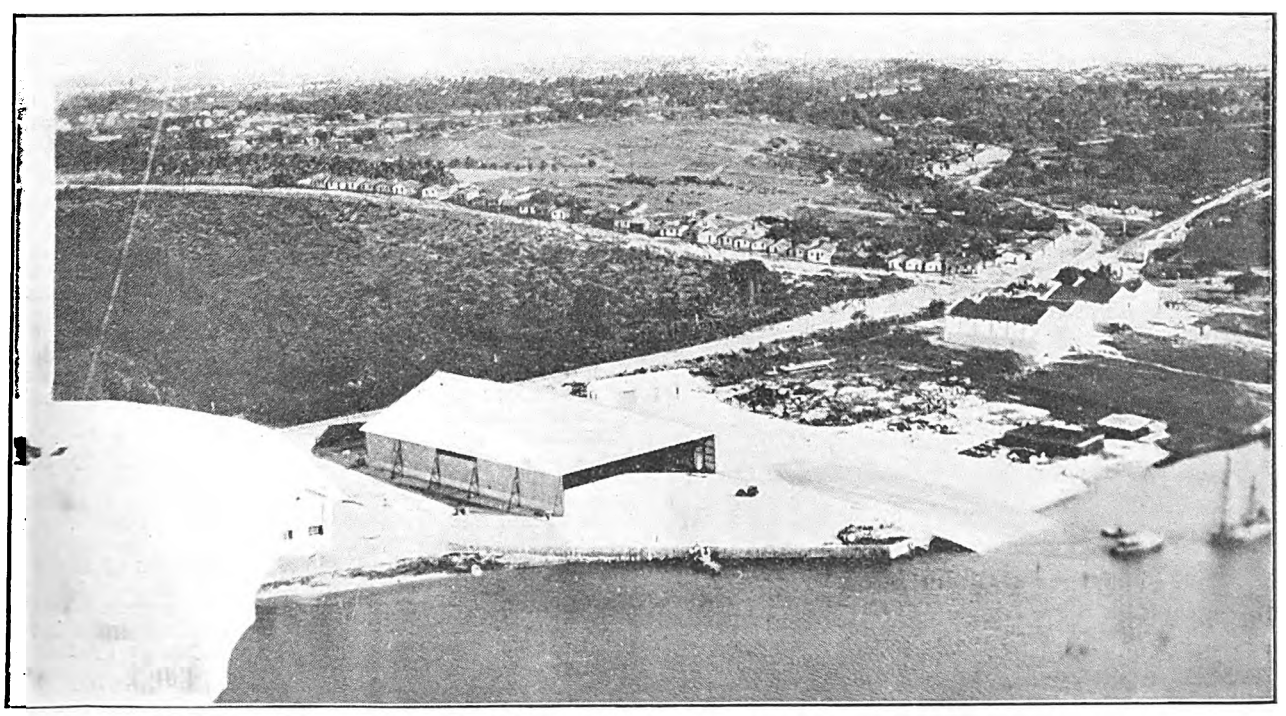
One day last week Mr. David Longden and Mr. H. Burroughes, two of the Directors of the firm, gave up most of their time for a day showing one round the factory as it is being re-organised. One does not propose here to describe in detail the methods of construction used by the Gloster Co. under the Steel Wing Patents, but one can say that though other methods used in this country may be up to the same high standard, there is certainly nothing done in any other country in the World which equals this peculiarly British type of work.

The chief work of this department at the present moment is the manufacture of steel wings for a well-known type of two-seater biplane which is standard equipment in the R.A.F. When one states that these wings are something like one hundred pounds a set lighter than the corresponding wings made in wood, and that, though a couple of hundred sets of these wings are now in service all over the World, there has not been a single instance of one of those wings failing in the air, some idea may be gathered of the value of the work which is being done.

Of the firm's own work one is not at liberty to write at the moment. But one can say that certain types of machines which are now coming through are as interesting as anything one has seen in the Aircraft Industry.

Another of the firm's products which is well worth watching is the Hele-Shaw Variable Pitch Airscrew. A number of these have been made so that they can be given a thorough test under Service conditions by the Air Force. And if in the bulk they stand up as well as those which have been used purely experimentally there is no doubt that this airscrew will have a great future. One watched the test of one of these airscrews on a Jupiter engine on a test stand, and certainly the whole mechanism seemed to work with the greatest accuracy and simplicity.

Much as those of us who are keen on sporting flying will regret the firm's decision to become commercial, we must none the less wish them every success in the new policy if only for the self-sacrificing way in which they have supported the Sport of flying in the past. And we must remember that the export of British Aircraft for hard cash is in the end what this country most needs to cure the unemployment troubles.—C. G. G.



THE GATEWAY OF THE NEW WORLD.—The Aéropostale Aerodrome at Port Natal, Brazil, whither and whence the French carry business between Europe and the money-makers of Brazil, Argentina and Chile.

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approximately 200 members under active instruction, which number is rapidly increasing Many members have purchased their own aeroplanes.

The following statement illustrates the growth of membership. It will be appreciated that every increase in membership has a large effect on the revenue; for the larger the number of members enrolled the more flying is done and the more licenses are obtained to qualify for subsidies.

1929. Oct. 1, 484 members; Nov. 1, 746; Dec. 1, 873.

1930. Jan. 1, 992 members; Feb. 1, 1,110; Mar. 1, 1,183; Apr. 1, 1,298; May 1, 1,338; June 1, 1,500.

Flying Record.—Active operations were started in September, 1929, when the Company's main centre at Hanworth Park was opened. This was followed shortly after by the opening of the centres at Hull and Reading and the taking over of further centres at Leeds and Nottingham.

In spite of the fact that the Company has only been in active operation for 9 months, its aircraft have flown for more than 7,900 hours, which represents over 635,000 miles, or 25 times round the World at the Equator.

The Company's business is divided into two very definite periods—the bad and the good flying seasons. Operations were started through force of circumstances, at the beginning of the bad season, which meant that the Company had to carry its organisation through the bad time with practically no impetus behind it. Therefore the figures now given represent to a large extent the flying done during the period of preliminary development, and also during the worst season of the year:—

Month ending	Hours flown. London	Provinces	Total.
1929.			
Sept. 31	692.50	67.55	760.45
Oct. 3	576.20	230.25	806.45
Nov.	433.15	206.40	639.55
Dec.	400.30	155.35	555.35
1930.			
Jan.	448.30	210.15	658.45
Feb.	446.25	255.55	702.20
March	705.00	394.40	1,099.40
April	568.05	410.40	978.45
May	785.10	539.35	1,324.45
			7,527.15

To the above total must be added 309.55 hours prior to last September and 106.25 hours flown on joy-riding operations this spring. The grand total is therefore 7,943.45 hours.

Over and above the large increase of flying by members, the demand for air taxis is daily increasing. These fly, not only to all parts of the country, but also are hired to take passengers, at short notice, to the Continent.

Joy-riding.—Short passenger flights, commonly called joy-riding have proved to be a profitable sideline to the Company's activities, and four of the taxi machines are being employed on joy-riding throughout the Summer season. The firm expect that from 1,500 to 2,000 passengers will be carried per week by these machines, apart from regular joy-riding at the main centres.

Aircraft Sales.—Up to this date the Company have sold a considerable number of aircraft, although the real selling season did not begin until May. A very large number of definite inquiries have been received, which the firm expect will lead to a large volume of business, particularly from the Continent, where valuable connections have been established for the sale of taxi machines.

The operations of National Flying Services have created such a favourable impression, both in the Colonies and abroad, that inquiries have been made from Canada, the U.S.A., and from a very large number of Continental countries, asking for details of the organisation of National Flying Services, on which similar organisations on a smaller scale can be established.

Air Taxi Work.—N.F.S. Air Taxis are now stationed at London (Hanworth), Leeds, Hull, Reading, Nottingham, Blackpool, Scarborough, and, temporarily, Swansea.

The type of aeroplane most used for air taxi work is the Desoutter cabin monoplane, which carries two passengers and is capable of a cruising speed of 95 miles an hour. Eleven of these machines have been taken into service, 9 of which are in active operation and 2 in reserve.

The total fleet of aircraft available at the stations of National Flying Services numbers 55 machines and all these can be called upon for urgent taxi missions. In addition to the two-passenger Desoutters, the fleet includes Moths, Bluebirds and Spartans, which are single-passenger machines of the conventional light aeroplane class.

An eight-passenger machine is available for the transport of large parties, and is at present stationed at Hull. This is a D.H.61.

In addition to the hire of air taxis for urgent journeys, many people are now chartering machines for holiday flights, especially for trips to Le Touquet, Dinard and Biarritz. Short sight-seeing trips are also proving an attraction. For example, a flight for two people from Hanworth to Windsor Castle and back is obtainable for £1 per head, including transport to and from Trafalgar Square.

Air taxis can be hired to fly to practically any destination, and have already been chartered for journeys to practically every important centre of England and also to most of the big cities on the Continent. Among the towns visited on these flights are Bath, Bristol, Berlin, Biarritz, Brighton, Cardiff, Camborne (Devon), Canterbury, Cowes, Deauville, Dinard, Edinburgh, Eastbourne, Exeter, Glasgow, Hitchin, Hull, Leeds, Luton, Le Touquet, Liverpool, Manchester, Norwich, Northampton, Oxford, Ostende, Paris, Penzance, Selsea, Southampton, Torquay, Teignmouth, Uttoxeter, Wolverhampton, and Yeovil.

An example of the value of an air taxi organisation with branches in all parts of the country is furnished by a recent booking. A Dutch business man arrived at Harwich at 6 a.m. An air taxi flew him to Hull, where he did his business and flew back to Harwich in time to catch the return boat to Holland the same night.

A TEST MATCH.

The ancient and effete modes of travel were definitely discredited by the Liverpool and District Aero Club in a most amusing and well staged series of flights on June 2, 3, 5 and 6. Over its chosen tracks the railway is generally conceded to be the fastest practical mode of travel on land, and with fine bravado the proponents of flying chose their starting times to coincide with those of express trains to the destinations of the day.

The experiment was fostered by Messrs. Lewis, of Ranelagh St., Liverpool, who sent a representative by each of the two modes of travel to transact business at the same destination. The start was made simultaneously from the Liverpool premises of Messrs. Lewis and each party made the best time possible to their appointment and back again. The one who travelled by air on each of the four days' journeys combined with his rôle of hustling business man that of journalist, and his successive articles in *The Liverpool Daily Post and Mercury* make an interesting psychological study, as he seems to have been new to flying.

Besides giving the railways, which were evidently unwitting participants in the great test, the benefit of starting times, the flying fraternity also chose an air vehicle of very ordinary speed, to wit, one of the Liverpool Club's two-year-old Avians with a cruising speed of about 75 m.p.h. (And comfortable 'buses they are, moreover.—F. D. B.)

The first day's trial was from Liverpool to Glasgow and back.

The time-table reads thus:—

AIR.—Leave Hooton 10.70 hrs., reach Renfrew Aerodrome 13.08, report at Lewis's (Glasgow) 13.30. Leave Renfrew 15.06, reach Hooton 17.33, Report Lewis's (Liverpool) 18.05.

TRAIN.—Leave Liverpool 09.50 hrs., reach Glasgow 15.57, report at Lewis's 16.15. Leave Glasgow 16.30, reach Liverpool 22.15. Too late to report.

The next day the test was over the route: Liverpool-Manchester-Birmingham-Liverpool. It was not quite such a walk-over for the aeroplane as the flights were comparatively short and six journeys had to be made from cities to their aerodromes or *vice versa*. The time-tables show how the aviators made up their initial loss, apparently by scamping their business at Manchester, and gained rather more than an hour on the mere earthbound.

AIR.—Left Hooton 10.20 hrs., landed at Barton 10.50, report at Lewis's 11.20. Left Barton 12.20, landed at Castle Bromwich 14.20, report at Lewis's 14.40. Left Castle Bromwich 15.40, landed at Hooton 16.50, report at Lewis's 17.20.

TRAIN.—Left Liverpool 10.05 hrs., reached Manchester 10.48, report at Lewis's 10.58. Left Manchester 12.20, reached Birmingham 15.05, report at Lewis's 15.10. Left Birmingham 15.50, reached Liverpool 16.35, report at Lewis's 18.40.

On this particular trip the Black Country justified its name and visibility was singularly bad. Foggy conditions had prevailed to some extent the day before, but were not nearly as serious.

The next day's trial was run to Croydon Aerodrome to meet the Paris-London service and collect some Paris frocks. This gave the air-route some advantage, and the frocks were on display in the Liverpool Store of the enterprising Messrs. Lewis at 14.00 hours instead of arriving too late for the day's business at 20.30.

The final trial was run to Leeds and Hull, and showed an advantage of slightly more than two hours for the aeroplane.

The pilots were Messrs. R. H. Thornton, Frank Davidson, and Alan Moulsdale. The passenger was the same throughout, and whereas he weathered the first two days of fog with confessed tremors he waxed enthusiastic before the trials were over.

On the whole it seems to have been an excellent piece of sport combined with publicity, and a few more such tests over various parts of the country might almost convince a few more people that aviation is a practical time-saver, and will be immensely more so with improved aerodrome

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facilities and even the machines of to-day rather than yesterday.

[One finds this test peculiarly interesting because in the year 1905, as a member of the staff of Iliffe and Sons Ltd., one took part, as an observer for *The Autocar*, in a precisely similar test organised by the Argyll Co. of Glasgow (the Chief of which was Lt.-Col. Matthew, now of the Dunlop Co.). The driver of the car was Mr. Sam Lea, who later founded S. T. Lea Ltd., of Bond St., who now run the Klemm Monoplane. But, whereas the aeroplane in this test directly challenged the train, we deliberately chose criss-cross routes where train connections were bad, in an endeavour—which at that time seemed pretty hopeless—to prove to English business men that a motor-car had commercial possibilities and was not merely an expensive toy which could only be owned and used by a few rich young sportsmen. Curious how history repeats itself.—C. G. G.]

MANY INVENTIONS.

Critics who used to say that internal air-lines would never be any use in this country now sit dumb in dark corners biting their thumb, numb with annoyance at the new Imperial Airway's Liverpool—Manchester—Birmingham—London service. [No they don't, Friend Spry! They merely say that a regular air line running to schedule cannot operate North of Birmingham in our Winter. Just you watch.—C. G. G.] As an internal air line it may not beat the fast train services with sufficient margin to make it worth while, but as it is designed to connect the Continent with the North of England by air by way of the Airport of London, the Liverpool—London side of it is not the most important.

Leaving Liverpool at 07.00, Manchester at 07.25, and Birmingham at 08.20, passengers can make same-day connections with about 20 important Continental cities and some of the connections are extremely good ones. Paris can be reached at noon, for example, Rotterdam at 13.00 and Hamburg at 16.10. And the traveller can take his cocktail as far afield as Copenhagen at 18.20 or dine in Berlin at 19.30. [Who wants to dine at half-past seven? Don't be so suburban, Spry.—C. G. G.]

The ire of Liverpudlians may be roused that this is called a "New Direct Service," for no respectable bee from that city would make its line to include such mere wayside halts as Manchester and Birmingham, but all three of these cities will probably get a direct bee-line service as the crow flies, between their home town and London as soon as ever they fill up a machine or two a day apiece.

From Croydon the machine leaves at 17.15, thus collecting passengers from most of the inward air-lines, and brings people home to Birmingham, Manchester and Liverpool at 18.35, 19.30 and 19.55 respectively. [Fancy landing at five minutes to eight in a Mersey mist on a November evening.—C. G. G.]

Another new air line, interesting because it is totally unsubsidised, is the Walcot Air Line which recently inaugurated London—Le Touquet services twice a day in each direction. The home of this air line is Eros House, Piccadilly, and passengers leaving there at 10.15 and 17.15 can be in Le Touquet itself by 12.45 and 19.45. The return journeys are 07.30 and 12.30. The former arrive at Eros House at 10.00 (in time for business) and the latter at 14.45.

Bookings during the first week were extremely brisk in both directions. Walcot Air Lines have a couple of good-looking Junkers F.13 machines with L.5 type Junkers engines. This firm also undertakes special charter work and anyone who knows the comfort and freedom from noise as well as the reliability of these aeroplanes will be well advised to try the Le Touquet service one time or another.

Not long ago a gentleman who had (or thought he had) made all arrangements to travel to Buda-Pesth by special plane leaving Croydon at the veritable crack of dawn, i.e., 03.30 hrs., suddenly discovered at about midnight that he had no carnet. Now to travel by air abroad without a carnet is about as hopeless a proposition as trying to swim the Channel with a floating gizzard in a leather coat, bowler hat and field boots. The A.A. Aviation Department, which luckily is open all night, was applied to and not only produced a beautifully illuminated carnet on double-milled cream-wove gilt-edged paper but produced a map of the lesser known landing grounds in the Kingdom of Pesth with telephone numbers and other useful information. It is even whispered that the names of two respectable night-clubs in Buda were gratuitously disclosed.

Over the subsequent flight a veil may be drawn. Suffice it to say that the passenger got away at 03.30 hrs. (which otherwise he would not have done) owing to the very efficient service of the A.A. Aviation Department.

Recently a newspaper reported the forced landing of a Norwich Aero Club machine, during the course of which "the undercarriage of the propeller wire was broken, but neither the pilot nor his passenger was hurt." What do you know about that?

Air Union have been carrying a very large quantity of Ascot frocks from Paris recently. This year's traffic in such frivolities has been much larger than in any previous year.

Amongst items of "intelligence" from an American Aviation paper is the following:—"Stanley Zerrambo, senior inspector of immigration border patrol at Detroit, Michigan, prevents take-off of airplane known to be smuggling aliens by driving his automobile into spinning propeller as plane warms up on ground. Pilot escapes but aliens are taken."

One cannot but be glad that this adventure story has a happy ending, except possibly for the aliens, who probably had little or no luck with Stan Zerrambo.—SPRY.

A TALE OF THREE CITIES.

On June 16, Mr. O. P. Jones, of Imperial Airways, took off an Argosy (Three Jaguars) from Croydon at 17.15 hours and flew to Birmingham, Manchester and Liverpool, at which cities his times of arrival were respectively 18.35, 19.30 and 19.55 hours respectively. Thus opens the first commercial passenger line linking the North of England with the South and the Continent. It is mainly experimental to start with, and is being subsidised by the three cities.

The northward journeys will be made on Mondays, Wednesdays and Fridays, and the southward trips on Tuesdays, Thursdays and Saturdays, on which days the liner will leave Liverpool at 07.00 hours and reach Croydon at 09.40 hours in time to connect with the services to the Continent.

The Argosy which made the inaugural flight carried twelve passengers, but for regular operation Handley-Page 14-seater machines (two Rolls-Royce F engines) will be used.

AN ITALIAN AIR-LINE MISHAP.

On June 10 a Dornier seaplane on the Italian *Aero Expresso* route between Athens and Constantinople caught fire as it was taking off from Mytilene for Athens.

The fire was caused by a defect in one of the carburettors. The pilot immediately returned to his base and landed all seven passengers before they suffered any injury. The aeroplane was totally destroyed. The report says that the occupants probably owe their lives to the all-metal construction of the machine. One of the passengers is said to be a well-known French writer, so in due course we shall probably hear all about it.

THE NEWEST DUNLOP PRODUCT.

A test load of forty tons has been resisted without any sign of damage by a new aeroplane wheel made at the Dunlop works, Coventry, for the Handley Page air liner (H.P.42) which is being built for Imperial Airways Ltd.

The design of both wheel and tyre is quite novel and despite its bulk and reserve of strength the new equipment weighs under 400 lbs. The tyre itself is curious in that the tread of the tyre is very wide in proportion to the part which is attached to the wheel. The idea is to have a wide tread which will not sink into soft ground, without having a corresponding wide, and therefore heavy, rim and hub.

JUXTAPOSITION IS EVERYTHING.

There is something grimly significant and suggestive in the sequence of the following two paragraphs which appear in the minutes of the Public Services Committee of the Thornton Cleveleys Urban District Council, and were confirmed at the Monthly Meeting of the Council held recently:—

(A) Submitted letter from Alan Cobham Aviation, Ltd., respecting the allocation of Municipal Landing Grounds."

(B) "Resolved that the letter be referred to the Town Planning Sub. Committee and also the advisability of provision for a public cemetery."—G. S. C.

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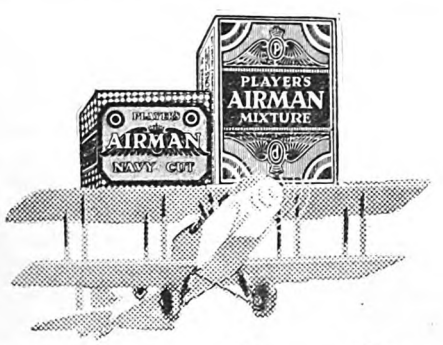

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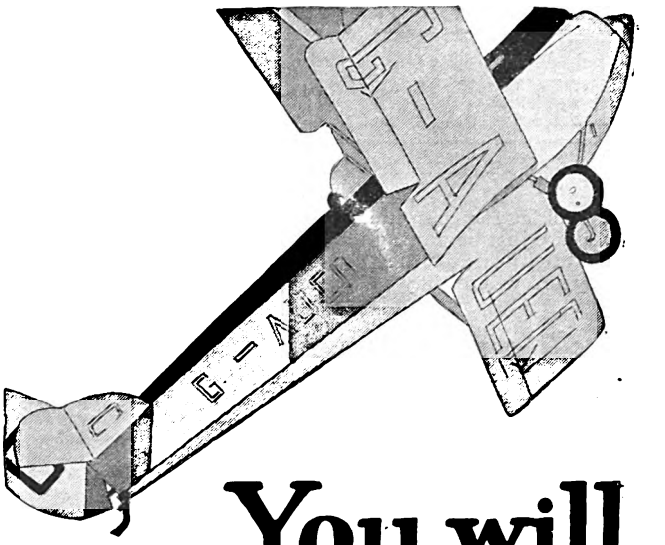

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AN AIR-MAIL SERVICE TO THE CANARIES.

The Madrid correspondent of *The Times* announces that an air mail service between Madrid and the Canary Islands was opened on May 21, when a three-engined aeroplane left Madrid at 2 a.m. with 600 lbs. of mails. It was due to reach Las Palmas before nightfall.

This machine may perhaps be the Ford Trimotor about which there has been much litigation in Spain as a result of the action between the Junkers and Ford Companies.

ACTIVITIES IN THE WEST ATLANTIC.

Atlantic Airways Ltd. have been requested by the Governor of Trinidad and the Governor of the Bahamas to advise on the selection and layout of civil airports in the West Indies and Brigadier-General Francis Festing, C.B., C.M.G., the special representative of Atlantic Airways Ltd., who has lately been in Canada and U.S.A., is now on his way to Trinidad to do this work.

Garraway, Black and Company are the Managing Agents of the Company and the registered offices are at 14, Avenue Chambers, Southampton Row, London, W.C.1.

THE AIR HOG AT BISLEY.

A correspondent of THE AEROPLANE reports that a red and silver winged Moth, with the letters AADP, swooped three times on the firing point of the 500 yds. range at Bisley on June 14, when thirty Public Schools were engaged in the closing details of the Sussex County Shoot.

The writer of the letter says that many of those present considered it an exhibition of extremely bad taste. With which sentiments THE AEROPLANE heartily agrees.

TO CAPITALISTS ONLY.

An aircraft firm which has a particularly good name and whose products have a very high reputation is looking out for fresh capital. The business is in a thoroughly sound condition and has plenty of orders in hand,—but it has such a greatly increased amount of business in prospect that some of the prospective orders may be lost unless the capital can be increased so that the output may be correspondingly increased. Anybody who is interested in such a proposition is invited to write to C. G. Grey, Editor of THE AEROPLANE, 175 Piccadilly, W.1.,—by whom such communications will be treated as strictly confidential.

THE GAUGE.

The May issue of *The Gauge*, the House Organ of J. J. Habershon and Sons Ltd., the famous makers of cold rolled strip, deep drawing steel, rustless iron and alloy steels for the aircraft trade, has in its middle a double page picture of the Blackburn Bluebird by Mr. W. E. Johns, of the General and Fine Arts Co. This picture, a very apt selection for the topic of the moment, is published as one of a series which are appearing in *The Gauge* under the title of Types of Aircraft in which Habershon strip and sheet steel is used.

The Gauge is an interesting little magazine about which references have appeared in THE AEROPLANE from time to time, for one may gain from it some glimpse of those qualities which have made the firm as outstanding as it is to-day.

The editorial for this month refers to the sports facilities which are now available to the employees of the firm; these include football, cricket, tennis, and bowls. *The ground and all tackle are for the free use and enjoyment of all the firm's employees.*

A particularly informative article has been appearing in *The Gauge*, in instalments; it is called The Organisation at Holmes Mills. This month the organisation of the correspondence system is explained and set out. This postal business is one to which in the general way not enough attention is given, with much consequent overlapping and resultant impression of casualness to the customer or supplier. Our own Trade might well study these methods.

J. J. Habershon and Sons Ltd. realise that the correspondence is one of the most important divisions of office organisation, and that lack of care and tact in dealing with correspondence may antagonise many a good customer. After all in every communication the officer of the company represents the company to the recipient of the letter; what the officer says the company says and so the firm has taken every care that each letter that leaves the office shall continue to build up goodwill.

GOOD SERVICE FROM SPEEDOLENE.

The development of air traffic is dependent mainly on landing grounds and almost as much on adequate provision for fuel, oil and service. Silvertown Lubricants Ltd., whose Speedolene Aero-engine Oils are used and approved by the Royal Air Force and such builders of engines as the Bristol Aeroplane Co., the Armstrong Siddeley Co., Cirrus Aero Engines Ltd., and the De Havilland Aircraft Co. Ltd., played their part most efficiently in Mr. Alan S. Butler's flight to Cape Town in the Gloster Survey (two Jupiters).

The aeroplane is owned by the Aircraft Operating Co. Ltd. and was needed for service in South Africa, so that the flight made by Mr. and Mrs. Butler was purely commercial. At very short notice Speedolene P.4 oil, as recommended for Jupiters by the makers, was ready at 30 assorted possible points of call on the 9,000-mile route. Mr. Butler, who has just got back from his trip, says that the oil gave complete satisfaction, and also that the representatives of the firm were most courteous and efficient.

PERSONAL NOTICES.

BIRTHS.

BRYSON.—On June 7, at Quetta, to Mildred Cecile, wife of Sq. Ldr. Oliver C. Bryson, M.C., D.F.C., A.M., R.A.F.—a daughter.

INNES-SMITH.—On June 7, at Murree, India, to the wife of Flt. Lt. Neil Innes-Smith, M.B., Ch.B., R.A.F. Medical Branch—a son.

DEATHS.

FLETCHER.—On June 13, at Wittering, Northamptonshire, as the result of a flying accident, Flt. Lt. Nigel Henry Neville Fletcher, Central Flying School, R.A.F.

Flight Lieutenant Fletcher served with the R.F.C. and R.A.F. during the War 1914-18 and was placed on the unemployed list in August 1919. In November 1923 he was appointed to a short-service commission with the rank of Flying Officer and posted to the R.A.F. Base, Leuchars, Fife. He was attached to various Units at Leuchars until April 1928, when he was posted to No. 1 Flying Training School, Netheravon. In September 1928 he was posted to the Central Flying School and in July 1929 he was promoted to Flight Lieutenant.

HINDELANG.—On June 13, at Kohat, India, as the result of a flying accident, Sjt. Edward Albert Hindelang, No. 60 (Bomber) Squadron, R.A.F.

LANSDELL.—On June 14, at Kohat, India, as the result of a flying accident on June 13, L-AC. William Henry Lansdell, No. 60 (Bomber) Squadron, R.A.F.

O'MEARA.—On June 12, at Upavon, Wiltshire, as the result of a flying accident, Sjt. Frederick Ernest O'Meara, No. 100 (Bomber) Squadron, R.A.F.

FORTHCOMING MARRIAGES.

HARDMAN—THOMPSON.—The marriage arranged between Flt. Lt. J. D. I. Hardman, D.F.C., R.A.F., and Miss Dorothy Ashcroft Thompson will take place on July 8.

HILL—SCOTT.—The engagement is announced between Flt. Lt. James Hill, M.B., R.A.F., second son of James Hill, M.D., and the late Mrs. Hill, Argyll Lodge, Renfrew, and Chrissie Kennedy, younger daughter of the late Fred Scott and Mrs. Scott, Westmoor, Rainham, Kent.

TILLARD—BROOKE.—The marriage between Flt. Lt. Leslie Tillard, R.A.F., and Miss Winifred Mary Brooke, will take place on July 2.

MARRIAGE.

IVELAW-CHAPMAN—SHORTT.—On June 12, at Wrotham, Flt. Lt. Ronald Ivelaw-Chapman, R.A.F., to Betty, only daughter of Mr. and Mrs. C. W. Shortt, Borough Green, Kent.

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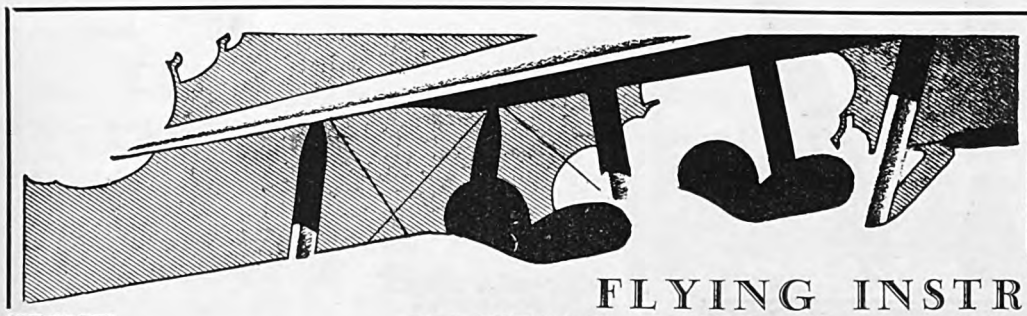

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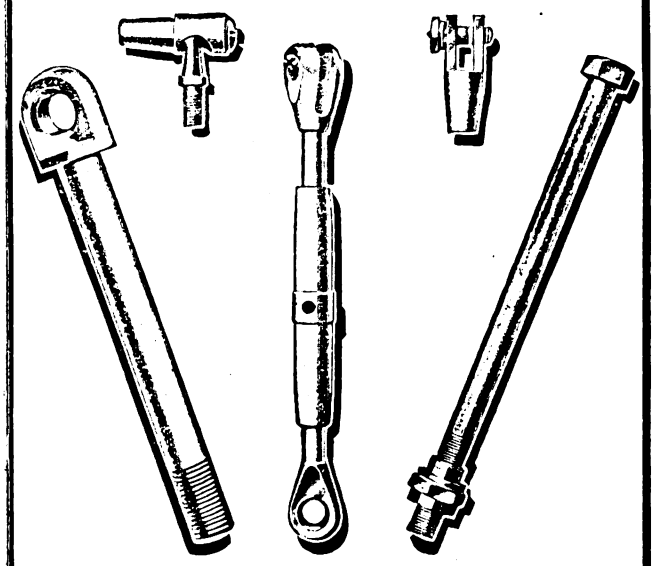

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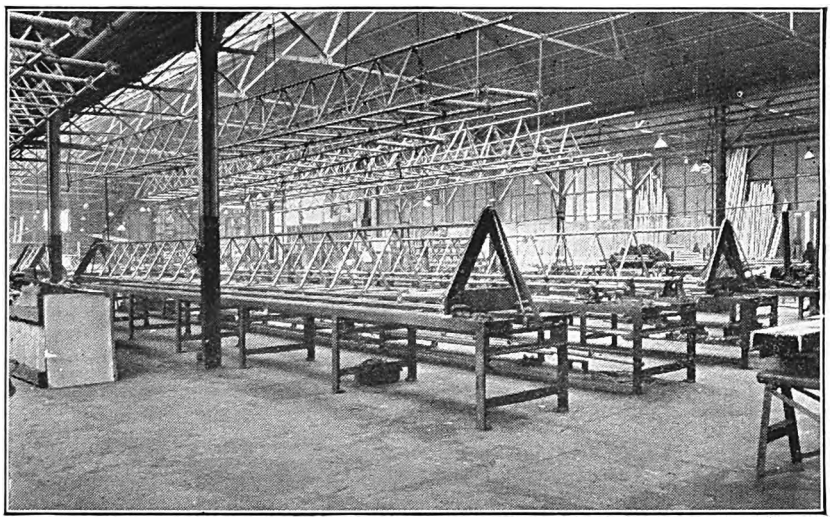
Without the use of the continuous heat treatment process the longitudinal girders for R.101 shown in this photograph could never have been made.



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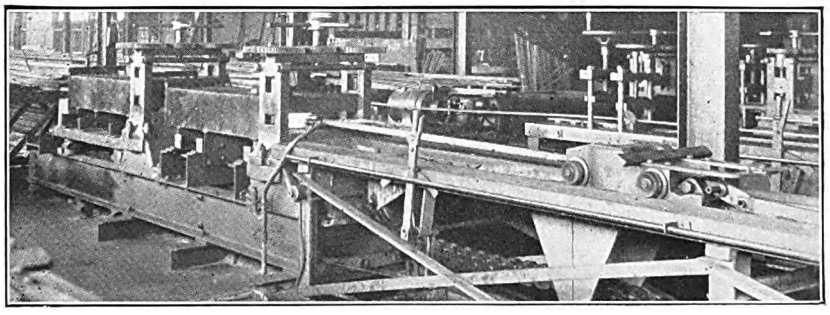

One of the drawbenches and furnaces used in the Boulton and Paul continuous heat treatment process.

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Edited by C.G.Grey

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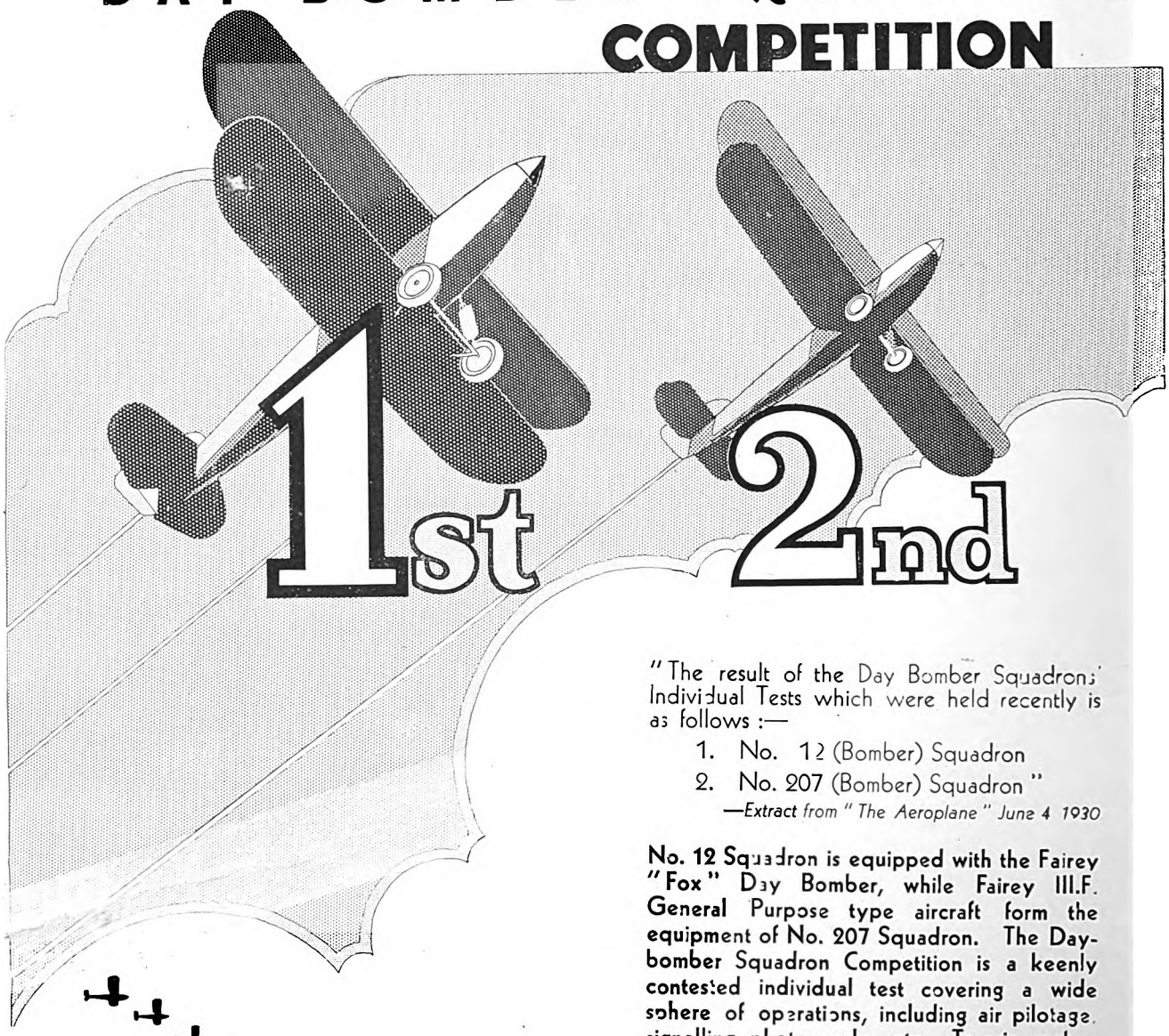
THE ROYAL AIR FORCE

DAY BOMBER SQUADRON COMPETITION



"The result of the Day Bomber Squadrons' Individual Tests which were held recently is as follows :—

1. No. 12 (Bomber) Squadron
2. No. 207 (Bomber) Squadron"

—*Extract from "The Aeroplane" June 4 1930*

No. 12 Squadron is equipped with the Fairey "Fox" Day Bomber, while Fairey III.F. General Purpose type aircraft form the equipment of No. 207 Squadron. The Day-bomber Squadron Competition is a keenly contested individual test covering a wide sphere of operations, including air pilotage, signalling, photography, etc. To win such a competition is not only a clear indication of individual merit, but also gives a very certain proof of the superiority of the winning aircraft for service operation.

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JUNE 25, 1930.

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Incorporating

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VOL. XXXVIII No. 26.

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ON R.A.F. PAGEANTRY.

On Saturday next the Royal Air Force will give its eleventh Display, Pageant, Review, or whatever the Great Great Ones of the Air Ministry choose to call it. Personally one prefers the word Pageant, for the impression given year after year by the splendid performance of the Air Force is of the pageantry of war. It is not exactly a Review, for that would imply a public inspection or exhibition of all arms and ranks. And Display is a vulgar-sounding word for such splendour. It suggests an assault-at-arms by over-developed athletes in white flannels,—which may be impressive, but has not the thrill of the R.A.F.'s great day. So Pageant ought to be the word.

If the organisers of the R.A.F. Display make a mistake in their choice of events it is in not giving the crowd enough pageantry. Consider the tens of thousands who are drawn to the Aldershot Tattoo at an unholy hour of the day, to go home at a still more unholy hour of the night, by pure pageantry and nothing else. There is not enough of that sort of thing at Hendon. Still, as a learner of English once remarked, "Some is good, but enough is too much"!

An onlooker has to be something of a specialist to appreciate the niceties of mock combats between two single-seat fighters, or between a high-speed bomber and a couple of fighters. And, though the meanest intelligence can appreciate displays of aerobatics, one can easily have too much of them, and anyhow they have a suggestion of stage-play about them which seems a little out of place on such a grand occasion. One would not suggest that they should be abolished, for they do display precisely the degree of skill acquired by our pilots and the degree of manœuvrability of our aeroplanes. They are instructive and entertaining, but they are not impressive.

The True Pageant.

The true spirit of pageantry is in massed manœuvres,—what Kipling calls "the spell of ordered movement." Nothing at Hendon has ever approached the effect of the take-off, and the evolutions which followed, of the fifty-four machines which were all in the air together four years ago. Even half-a-dozen lumbering obsolete twin-engined night-bombers taking off in formation is an impressive sight, and sound, and has in it something of the spirit of pageantry.

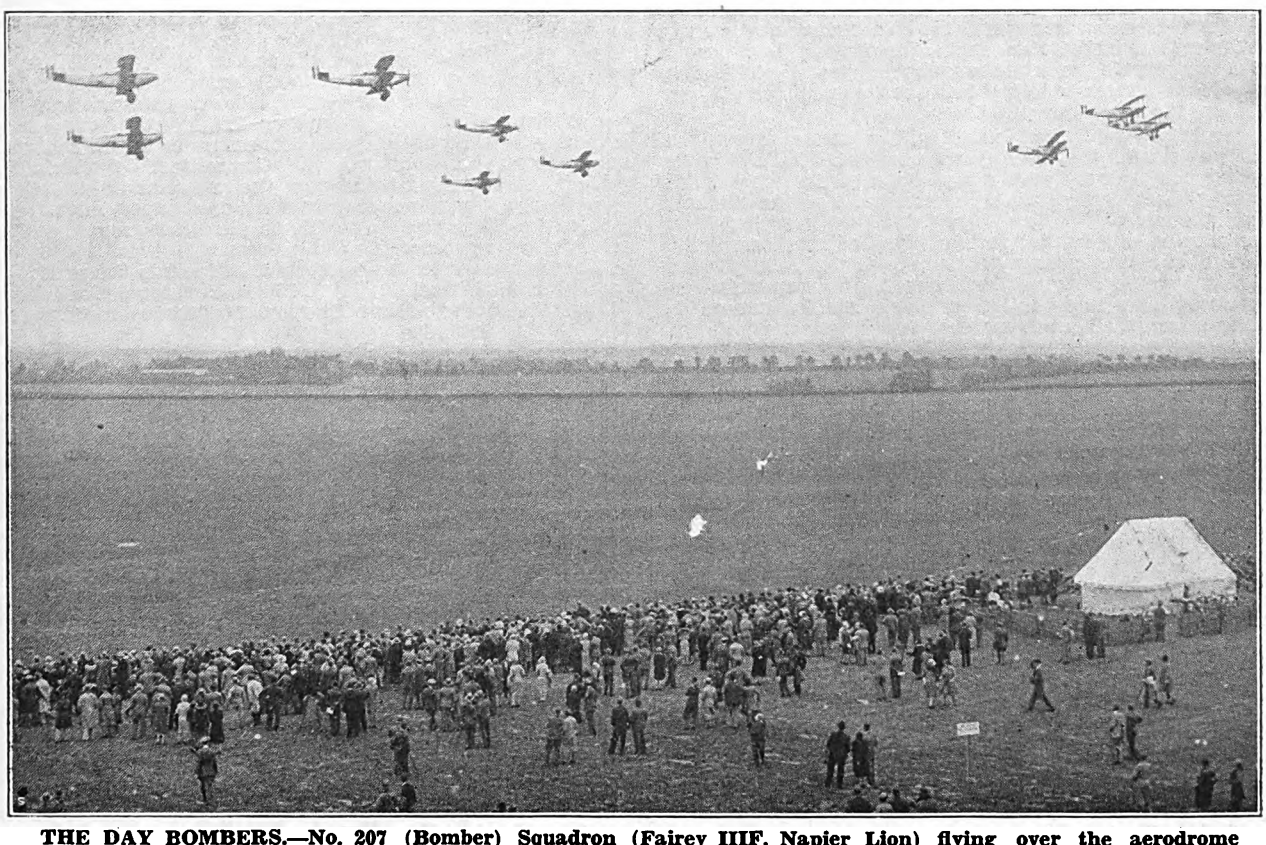
Last year most people agreed that the most striking thing of the day was the fly-past the Royal Enclosure of the Fox squadron. Whether the effect comes from the engines, or, as our high-brow scientists tell us, from the flutter of the tips of the metal air-screws, the fact remains that the ear-splitting scream of the diving Foxes made a more lasting impression than anything of the day. The most war-hardened aviators were moved by the sight and sound combined. And at Andover only last Friday one found that when a fine formation goes by full out it still has the power to thrill a Service audience which knows a good deal about flying.

Why the Display?

One peculiar psychological point about the Display seems worth discussing. Very few people seem to understand what the Display really is, or why it should exist. Some people seem to think that it is a kind of circus performance given to make money for R.A.F. charities. Some think that it is intended to overawe our possible enemies by a display of Air Power. Some think that it is merely to give our pilots a chance of showing off their skill.

All human motives are mixed, and no doubt these motives enter into the organisation of the Display. But actually

"COME AS THE WINDS COME, WHEN FORESTS ARE RENDED;
COME AS THE WAVES COME, WHEN NAVIES ARE STRANDED."
(Scott—*The Pibroch of Donald Dhu.*)



THE DAY BOMBERS.—No. 207 (Bomber) Squadron (Fairey IIIF, Napier Lion) flying over the aerodrome during the R.A.F. Display at Andover on June 20.—(*"Aeroplane" photograph.*)

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it is the culmination of the R.A.F.'s training for the year, and it is designed to show the British taxpayer what he is getting for his money.

The people who perform at the display are not specially picked and trained individuals or units. They are merely those who at the end of the year's training have shown up best. That is to say it is a show of prize-winners and of winning teams and not of professional acrobats.

FORMATION-FLYING.

Some people have an idea that all this beautiful formation-flying is merely a species of stunt and that people fly in patterns simply to look pretty. Actually formations have been invented for perfectly good warlike reasons, just as infantry drill was originally evolved.

Certain close formations were invented for mutual protection against attacks. Others were evolved purely for attack regardless of consequences. Others again were designed for proper orderly travelling over long distances, so that a number of aircraft might depart and arrive with military precision under proper leadership and not as a disorderly mob.

Some few days ago, during one of the rehearsals of the Display, a member of the staff of THE AEROPLANE got into conversation with the representative of a daily newspaper who seemed unable to understand what was the idea underlying all this formation flying. He understood the mutual protection idea of certain formations, but others frankly puzzled him, till some expression which he used indicated that he was, or had been, a member of the Senior Service.

The representative of THE AEROPLANE then indicated to him that certain of these forms were produced for precisely the same reason that station-keeping was invented in the Navy. That idea seemed to open an entirely new field of thought, and in an article on the R.A.F. Display in a daily paper a day or so afterwards references to keeping station occurred about half-a-dozen times within a few lines. One was glad to see this, for it indicates that the Marine Mind is not incapable of grasping the true inwardness of aviation.

THE NON-THINKING PUBLIC.

Although the R.A.F. Display is primarily designed with the idea of showing the taxpayer what he is getting for his money, one fears that some taxpayers do not appreciate the value that they are getting. A letter appeared in *The Times* a few days ago from a resident somewhere about Mill Hill complaining of the noise constantly made by formations of Service aircraft from Hendon,—and apparently suggesting, if the letter meant anything at all, that flying from Hendon should be forbidden in the interests of the denizens of the various bungaloid growths in the neighbourhood.

Though probably few of these people read THE AEROPLANE, perhaps those readers of THE AEROPLANE who come in touch with them accidentally will be so good as to point out to them that Hendon has been an aerodrome for twenty years (almost exactly, this week) and that it has been a Service aerodrome for close on sixteen years. Therefore flying of one sort or another has been continuous all over that area for all those years.

If people are so foolish as to take a house alongside a big railway-station they really must not grumble at the noises made by the trains. And people who deliberately settle close to an aerodrome must not complain of the noise of the aeroplanes.

Incidentally, one cannot recollect any serious complaints from the studious young gentlemen of Mill Hill School, though one would imagine that they might very well complain about the interruption of their studies caused by howling aircraft. That is more or less by the way, though it bears on the subject.

HELPING A GOOD CAUSE.

One's most earnest hope at the moment is that all readers of THE AEROPLANE will be able to go to Hendon and enjoy the noise thoroughly on Saturday. THE AEROPLANE is not providing its readers this week with a free guide to the new type aircraft which will appear at the Display. Nor is it publishing a detailed description of the Display. All these things may be discovered in the Official Programme of the Display, Price 1s.

This fact deserves to be emphasised because the proceeds of the sales of the Programmes go to increase the R.A.F. charities which are administered by the Royal Air Force Memorial Fund, which was founded in memory of officers and men of the Royal Naval Air Service, the Royal Flying Corps and the Royal Air Force who died during the War. And none shall accuse this paper of depriving such a charity of its income.

This Memorial Fund has done philanthropic work of enormous value ever since the end of the War, and though it has a good deal of money, every penny is welcomed. Therefore one hopes that besides going to the Display all readers of this paper will buy their programmes like little ladies and gentlemen. And so, let us all hope for the right sort of weather and a record-breaking crowd on Saturday.

But let us remember also that even if the weather should be of the worst possible, the training of the R.A.F. is such that, weather permitting or not, it will certainly put up the finest show of flying that can be seen anywhere in the World, because we have the best men and the best aeroplanes and the best engines and the best system of training in the World.—C. G. G.

THE SEGRAVE MEMORIAL.

A number of well-known people connected with motoring, flying and motor-boating, have proposed that a trophy shall be put up in memory of the late Major Sir Henry Segrave and to commemorate his achievements. The suggestion is that the Trophy shall be awarded each year to the British subject who gives the best demonstration of the possibilities of travel by land, air or water.

The Memorandum which contains this proposal says:—

"We have in mind a scheme to encourage the youth of Great Britain to follow after and attain the ideals which Sir Henry Segrave kept always in his heart. It is for this reason and because we know it is the memorial which he himself would most appreciate, that we are providing a trophy to be known as 'the Segrave award for achievement on land, water, or in the air.' The simple idea behind this tribute is to stimulate others also to uphold British prestige before the world by demonstrating how the display of courage, initiative and skill, the spirit of adventure itself, can assist progress in mechanical development."

The award will be made, according to the Memorandum, every year "to the Briton who, in the opinion of the awarding committee, accomplishes the finest, most gallant demonstration of the possibilities of travel by land, air, or water."

The awarding committee will consist of the chairman of the Royal Automobile Club, the chairman of the Royal Aero Club, the president of the Marine Motoring Association, and the chairman of the Newspaper Proprietors' Association. The only possible objection to this seems to be the inclusion of a newspaper man on the Committee. Such is the jealousy in the news trade that the presence on the Committee of a man associated with one paper might well antagonise all papers belonging to all other groups, and so might get the Memorial a bad Press.

The signatures to the memorandum include those of:—

Lieutenant-Colonel J. T. C. Moore-Brabazon, Lord Louis Mountbatten, Sir Arthur Stanley, Mr. Malcolm Campbell, Mr. H. G. Selfridge, junr., Mr. K. Lee Guinness, Mr. Algernon Guinness, Lord Cottenham, Lord Howe, Major

AIR VISITORS.—A view of the tarmac at Heston with the assembled aeroplanes of competitors and visitors for the Gwynn Maddocks Cup competition.—(*"Aeroplane" photograph.*)

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World's land speed record. The late Sir Henry Segrave driving his Irving-Napier set up the World's land speed record of 231 m.p.h. NAPIER *engine*

Capt. Malcolm Campbell with his Napier engined Bluebird set up World's land speed records for 5 miles—211 m.p.h.—and 5 kilometres—216·03 m.p.h. NAPIER *engine*

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Colin Cooper, Sir Philip Sassoon, Mr. T. O. M. Sopwith, and Mr. Tim Birkin.

Subscriptions may be sent to Lord Brecknock, Westbourne House, Westbourne-street, W.2.

This memorial ought to appeal vividly to all readers of THE AEROPLANE. Henry Segrave made his name as a flying officer long before he became prominent in connection with motoring. And those who served with him will certainly wish to help to make the memorial a success. Those who have only been associated with him recently will equally wish to participate. And those who do not know him at all but who realise how important his short connection with Civil Aviation has been should certainly help to make the contribution of the aeronautical community to the memorial not less important than that of those who are concerned with motoring and motor-boating.—C. G. G.

FLYING IN FOG.

A series of experiments in connection with the investigation of flying in fog have recently been made by the Royal Aircraft Establishment at Farnborough.

On June 18 a pilot of the R.A.F. flying a standard Avro aeroplane and carrying a member of the Air Ministry Scientific Research Staff as a passenger, made a succession of five successful landings at Farnborough through a real fog which rose to height of 90 feet above the ground.

The apparatus used consisted of a small tethered sighting balloon 400 feet above the ground and about half a mile from the aerodrome. The machine had a pitch and yaw indicator on the dash board and a weight suspended by a wire a few feet below the landing carriage. The aeroplane left the ground for the first trial at 04.45 hours and flew through fog until it got into clear air above and then made use of the known height and position of the balloon to return to the aerodrome, gliding past the balloon at an angle indicated by the instruments and landing on the surface of the aerodrome by means of the indications given to the pilot by the lighting up of a red lamp on the dashboard when the suspended weight touched the ground.

The test was entirely successful and the pilot reported no difficulty. The machine took off again and the first trial was repeated. This also was successful. Three further trials were made.

From observations made from the top of the balloon shed at Farnborough note was made that when once the aeroplane disappeared from view in the top of the fog it was not seen again until after it had landed and taxied out into a clear area near the sheds. Though the clearer areas of the fog moved somewhat during the test the aircraft was not visible from the sheds at the moment of landing.

These experiments are considered to indicate a real advance in the technique of fog landing and the method should be of great practical use.

Regular readers of THE AEROPLANE will remember that the use of kite-balloons and "landing-sticks" of the type used by flying-boats in 1917 and later, was advocated in this paper for several years after Civil Aviation began in 1919, but the advocacy was abandoned some five years ago as any further pushing of the Scientific people seemed waste of time and space. They are to be congratulated on having re-discovered the idea.

Which reminds one of some equally interesting research experiments made at Upavon in the Autumn of 1918. Colonel Scott was in command at the time, but one cannot remember that he took any active part in the experiments. The apparatus was simple. It consisted of a large tethered goat, alleged to be the property of the Padré. No pitch and yaw indicators were required, nor was there a red lamp on the dash-board. When lost in the fog the pilot had simply to lean over the side and sniff and his home aerodrome direction, as well as his height, were immediately indicated. The untimely demise of the goat by order of a senior and unpopular officer who had found it in his bed, put an end to these experiments but they were considered to indicate a real advance in the technique of fog landing.

ROYALTY AT DESFORD.

On Friday, June 13, His Royal Highness the Duke of Gloucester flew from Northolt to Desford to open officially the Leicestershire Agricultural Show. At 11.10 hours the Royal aeroplane left Northolt, piloted by Sq. Ldr. Don, accompanied by a second machine carrying Captain Howard Kerr, the Duke's equerry, and his pilot, Flg. Off. Pearson Rogers.

The two machines flew low over the Agricultural Show grounds, where an enthusiastic demonstration took place, and landed at Desford Aerodrome a few minutes later.

The Duke was greeted by Mr. W. Lindsay Everard, M.P., President of the Leicestershire Aero Club, and Mrs. Everard. Mr. Everard handed to the Royal visitor a letter announcing that he had been elected an Honorary Member, and asked him to accept a membership badge, which the Duke took.

After opening the show His Royal Highness left Desford by air at 17.20 hours and reached Northolt at 18.15 hours.

LEADERS OF THE MOVEMENT.—Mrs. Alan S. Butler, Mrs. Nigel Norman and the Puss Moth at Heston for the Household Brigade party, which did much to bring the right people into the Flying Movement.

THE KING'S CUP RACE.

This race will start at 7 a.m. from Hanworth on July 5. The winner is expected to cross the finishing line at about 5 p.m. Flying will go on all day. Displays will be given at 12.0 noon, after the competing machines have started, and again between 3 p.m. and 5 p.m.

Admission to the public enclosures will cost 1s., 2s 6d. and 5s. Cars 2s. 6d. Tickets from usual agents. Luncheon, tea and refreshments (fully licensed) in all enclosures.

Tickets for the Club Enclosure may be had as follows:—

Members of the Royal Aero Club: Admission free for members on presentation of Royal Aero Club badge. Motor car 2s. 6d. Guests accompanying member 5s. Tickets from Hall Porter, Royal Aero Club.

Members of Associated Light Aeroplane Clubs: Admission for member 5s. Guests accompanying member 5s. Motor-car 2s. 6d. Tickets from Club Secretary.

Members of the Royal Air Force Club: On same conditions as Light Aeroplane Clubs.

Members of N.F.S. Clubs: Admission free for member. Motor-car, free. Guests accompanying member, 5s. Tickets from the Secretary, National Flying Services, Ltd., Grand Buildings, Trafalgar Square, W.C.2, or from the Club.

Private Owners and friends arriving by air: Admission and landing free. Tickets from the Secretary, National Flying Services, Ltd., Grand Buildings, Trafalgar Square, W.C.2.

[In connection with this, one would ask why N.F.S. Club members should be allowed to take their cars in free, when members of the Royal Aero Club have to pay for their cars to enter? Considering that this is a Royal Aero Club Meeting, and is only held at the N.F.S. aerodrome as a special favour to that firm, surely the privilege should be the other way round.—C. G. G.]

THE VEXED QUESTION AGAIN.

Separate or divided control is the perennially fresh discussion now occupying the French Ministers of Foreign Affairs, Finance, War, Marine and Air, under the chairmanship of the Prime Minister, M. Tardieu. A movement to put Civil Aviation under a control separate from the Military and Naval Air Services and to put the present Air Ministry under the Ministry of War is being supported by the Ministers of War and Marine.

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A NEW TUNNEL FOR THE N.P.L.

The National Physical Research Laboratory at Teddington will shortly be equipped with the new variable density tunnel which has just been built at the Sheffield works of John Brown and Co. Ltd.

The behaviour of materials and sections at ultra-high speeds is still very much an unknown quantity, and the only practical way to reproduce these conditions seems to be in atmosphere of greatly increased density. To achieve high pressure in a space large enough to contain a wind-tunnel and its equipment is a tremendous undertaking, but the National Advisory Committee for Aeronautics in the U.S.A. tackled the problem some ten years ago, and seven years ago were already discovering unsuspected facts about high-speed requirements.

Their first tunnel (which was actually invented and designed by a German aerodynamic engineer imported to America just after the War 1914-18) burst and caught fire, but another one has since been built. To-day the feeling in America is that a high-pressure tunnel is of less use than a real high-speed tunnel. So after all we may be lagging behind with our latest scientific toy.

The new British tunnel, or rather its container, is 50 ft. long and has an internal diameter of 17 ft. It is built of four of the largest seamless rolled-steel rings ever made, and these are joined by encircling butt-straps of tremendous size and strength. The hemispherical ends are made of steel castings, two each, which are joined by flanged and studded joints.

The container has been tested to 550 lbs. per square inch (or getting on for 40 atmospheres) and weighs 250 tons.

INCIDENTS.

On June 22 Mr. Eric McElroy and Mr. J. A. Scheffs, of London, were slightly injured when the aeroplane in which they had just taken off from Ostende for Abbeville failed to clear some houses. The pilot, M. Bolline, was seriously hurt and a woman in the courtyard was struck on the head with the tail skid which fractured her skull.

On June 22 Mr. Hilton Murray Philipson, of St. James' Court, London; Mr. James Murray Philipson, his brother, and their mechanic, came down with their Puss Moth in the English Channel between the north and east Goodwins. They ran into fog soon after starting from Croydon and were forced down to the water. While flying round a trawler the machine touched the water and went in. All three escaped, the Philipson brothers through the door and their engineer through the emergency exit in the roof. They hung onto the aeroplane, which was sinking, and were rescued by the trawler *Sirius*. Before it went down Mr. James Murray Philipson dived for his passport which was in the cabin, and their baggage was also saved. There was no question of engine-trouble of any kind.

THE STOCKHOLM AERO SHOW POSTPONEMENT.

Because of a strike the large central building and exhibition hall at Stockholm will not be finished in time for the International Aeronautical Exhibition announced for Sept. 6. Therefore the Committee has decided to postpone the show until May 15-31, 1931.

This is a grave error of judgment if the Committee want any support from the British Aircraft Industry, for these dates will practically clash with the dates of the Buenos Aires Exhibition, on which the British Trade will probably concentrate its energies,—seeing that there are many times as much business to be done in aircraft in South America as there is in Scandinavia.

A MEXICAN RECORD.

A non-stop flight from New York to Mexico City was made on June 21 by Col. Roberto Fierro, of the Mexican air forces. The journey took 16 hours 33 minutes, or an average speed of 133 m.p.h., and was made in a low-wing Lockheed Sirius monoplane.

THE TERRESTRIAL HEIGHT RECORD.

The expedition which set out to conquer Kanchenjunga, 28,150 ft., which is one of the tallest peaks in the Himalayas, were unable to reach its summit and consoled themselves, according to *The Times* of June 21, by climbing Jonsong Peak. This mountain is 24,000 ft. high and is said to be the most exalted piece of ground yet reached by man. It was climbed on June 3 and 8 by two separate parties of the expedition. The rumour that Jonsong will hereafter be known as Amy Peak is said to be without foundation.

RECOGNITION.

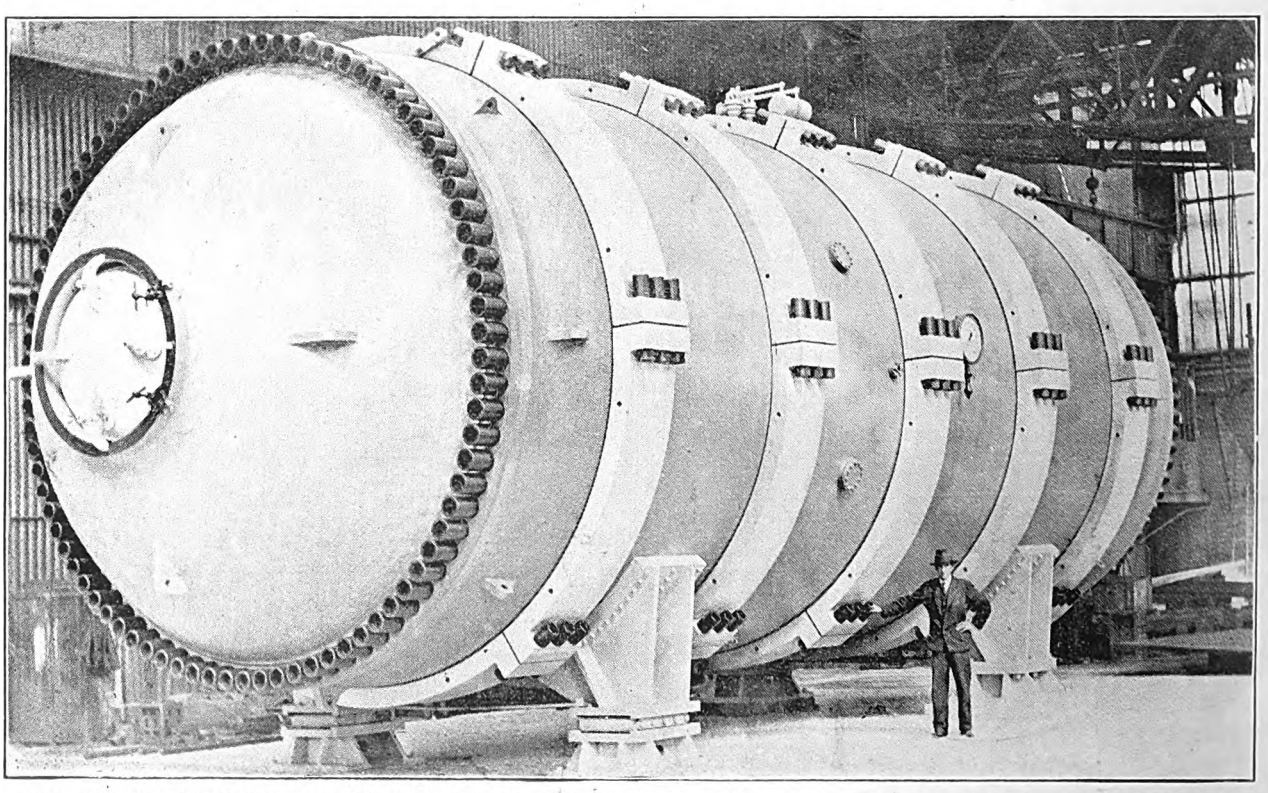
Aviation is at last an established fact. All of those who have been following flying for the last twenty years will be delighted that we have now received proper recognition. The "Police Review and Parade Gossip," which claims to be the leading and recognised organ of the Police Service, published on June 20 a Supplement giving a complete table of the identification marks of military and civil aircraft of all countries. We can now claim that aviation, like all noteworthy or notorious persons, is well known to the Police.

THE MYSTERY SHIP.

The following appeared in the daily papers on June 24:—

Captain R. D. Archibald, the British flyer, arrived in New York yesterday in the liner *Pennsylvania* with a tiny sky-going car which, he said, he would carry in his 'plane on future flights. He is having a 'plane built with a parking space for the car, which weighs only 1,100 lb., and stands about three feet high.—(*Reuter.*)

If anybody has ever heard of this gentleman and his wonderful scheme this paper would like to know something about him. THE AEROPLANE hates being left out of these secrets of great aviators.—C. G. G.



AN AID TO SCIENCE.—The Variable Density Wind-Tunnel which is about to be built into the National Physical Laboratory at Teddington.

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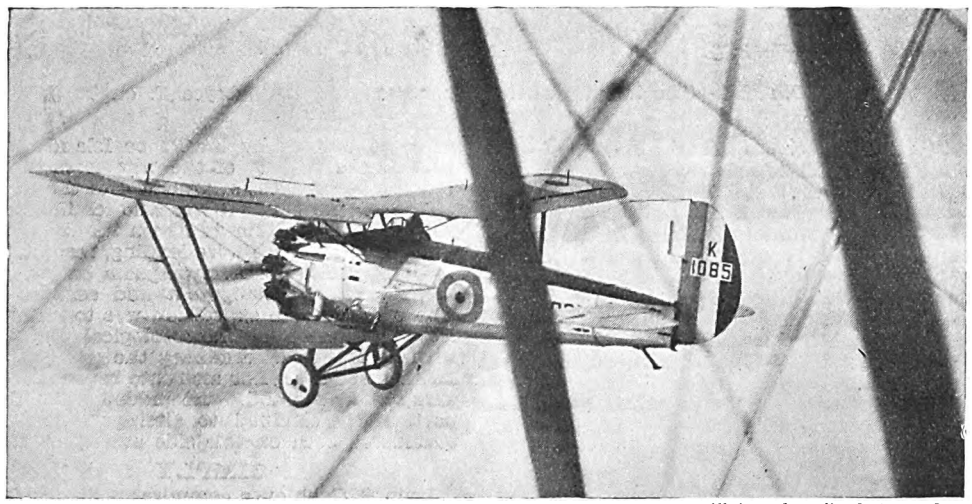
"Bristol"



—("Aeroplane" photograph.)

"Squadron-Leader Summers, flying a 'Bristol' Bulldog machine at an average speed of 163 miles per hour, won the Victorian Aerial Derby to-day.
There were 26 competitors."

Reuter's message from Melbourne, dated May 24th, 1930.

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THE ROYAL AIR FORCE.

The London Gazette.

Air Ministry, June 17.

ROYAL AIR FORCE.

GENERAL DUTIES BRANCH.—The following Plt. Offs. are promoted to the rank of Flg. Off.:—A. M. Cowell (Apr. 8); J. A. Easton (June 6); J. D. Rutherford, K. R. Coates, G. P. Charles, H. M. Pearson (June 15).

The following are placed on the retired list at their own request:—Group Capt. A. B. Burdett, D.S.O. (June 12); Sq. Ldr. G. S. Trewin, A.F.C. (June 17).

Flg. Off. H. A. Howes is transferred to the Reserve, Class C (June 5).

The S.S. comns. of the following Plt. Offs. on probation are terminated on cessation of duty:—N. H. Bantoft (June 18); J. H. Bell (June 13).

Lt. F. G. Wynne, R.N., Flg. Off., R.A.F., ceases to be attached to the R.A.F. on return to Naval duty (June 2).

MEDICAL BRANCH.—Flt. Lt. W. D. McKeown, M.B., B.Ch., relinquishes his S.S. comn. on account of ill-health (June 18).

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—C. W. J. Allen is granted a comn. in Class AA (i) as a Plt. Off. on probation (June 2); C. J. Sanders is granted a comn. in Class A as a Plt. Off. on probation (June 3). The following Plt. Off. on probation is confirmed in rank:—C. G. Higgins (June 5).

Flg. Off. C. E. Baldwin relinquishes his comn. on completion of service (Feb. 17).

ACCOUNTANT BRANCH.—Flg. Off. A. L. Palmer relinquishes his comn. on completion of service (Apr. 11).

MEDICAL BRANCH.—Flt. Lt. R. F. T. Grace, M.D., is re-employed with the Regular Air Force for a further year (May 19); Flt. Lt. T. M. Walker, M.R.C.S., L.R.C.P., is re-employed with the Regular Air Force for a period of one year (June 2).

AUXILIARY AIR FORCE.

GENERAL DUTIES BRANCH.—No. 608 (NORTH RIDING) (BOMBER) SQUADRON.—W. H. Davies to be Sq. Ldr. and to command the Squadron (Apr. 28).

Appointments.

Week ending June 23.

GENERAL DUTIES BRANCH.—Wing Commander D. A. Oliver, D.S.O., O.B.E., to Half-pay List, 22/6.

Squadron Leaders J. M. Robb, D.S.O., D.F.C., to No. 3 F.T.S., Grantham, 4/6. G. E. Godsave, to H.Q., Coastal Area, 16/6.

Flight Lieutenants H. S. Sandiford, to R.A.F. College, Cranwell, 16/6. R. A. Seaton, to R.A.F. Depot, Uxbridge, 26/5. H. G. P. Ovenden, to No. 58 Sqdn., Worthy Down, 26/5. K. L. Harris, to Half-pay List, 17/6. F. J. W. Mellersh, A.F.C., to Oxford University Air Sqdn., 19/6. M. H. Garnons-Williams, to A. and G.S., Eastchurch, 13/6. C. Guppy, to Station Flight, Upper Heyford, 19/6. H. A. J. Wilson, O.B.E., to R.A.F. Depot, Uxbridge, 13/6. J. H. Hagon, to Station H.Q., Donibristle, 12/6. H. F. Bradley, to No. 10 Sqdn., Upper Heyford, 10/6. R. K. Emerson, to H.Q., R.A.F., Middle East, Cairo, 1/6. A. D. Macdonald, M.C., to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn. (Supplementary List), 16/6.

Flying Officers A. P. Wayte, to R.A.F. Depot, Uxbridge, 26/5. A. L. T. Naish, to No. 55 Sqdn., 'Iraq, 13/6. R. A. R. Robinson, to R.A.F. Depot, Uxbridge, 6/6.

Pilot Officers M. V. de Satge, to No. 504 Sqdn., Nottingham, 12/6. G. G. Barrett, to No. 203 Sqdn., 'Iraq, 7/6. F. R. Drew, to No. 203 Sqdn., 'Iraq, 7/6.

MEDICAL BRANCH.—Squadron Leaders G. S. Marshall, O.B.E., to R.A.F. Depot, Uxbridge, 15/5. W. F. Wilson, M.C., to R.A.F. Depot, Uxbridge, 26/5.

STORES BRANCH.—Squadron Leader F. E. J. Coates, to Station H.Q., Manston, 2/7.

Flight Lieutenant C. W. Rugg, to R.A.F. Reception Depot, West Drayton, 5/6.

Flying Officer H. J. Young, M.B.E., to R.A.F. Depot, Uxbridge, 1/6

ACCOUNTANT BRANCH.—Flight Lieutenant D. F. A. Clarke, to R.A.F Depot, Abukir, Egypt, 5/6.

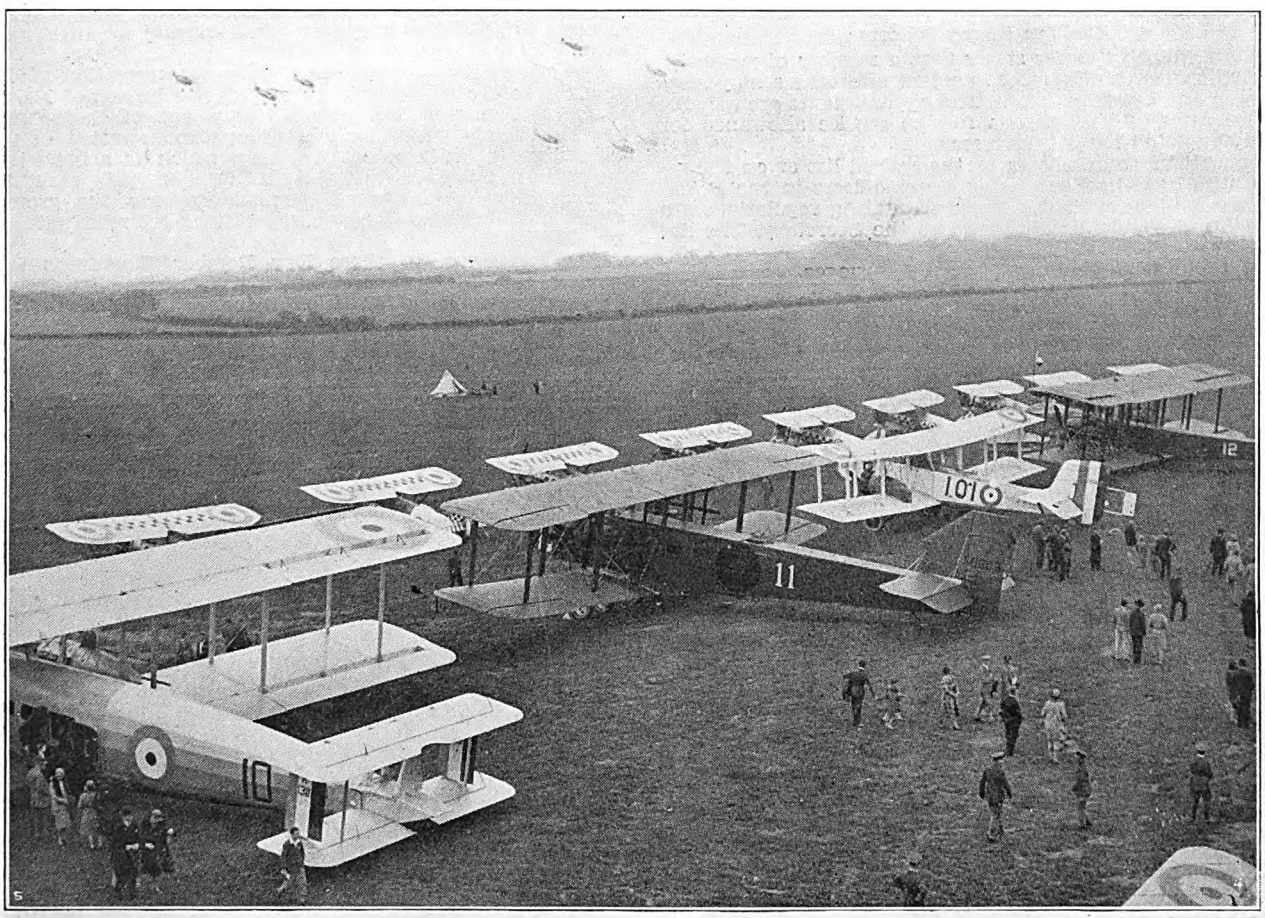
Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at North Weald, Essex, to a Moth machine of No. 29 (Fighter) Squadron, North Weald, on June 17, 1930, Wing Commander Bernard Edward Smythies, D.F.C., the pilot of the Aircraft was killed, and 561152, A.C.1 Frederick Reginald Stanley Holben was slightly injured.

At the Inquest at Epping on June 18 evidence was given that after taking off, the machine struck the awning of a roller on the aerodrome.

Some further information has been received about the death of Wing Commander Smythies.

He was flying a Moth, and instead of taxying out from the shed



ANDOVER AT HOME.—A Squadron of Armstrong Whitworth Siskins (Jaguar) flying past the Exhibition Park of various machines at the R.A.F. Display at Andover on June 20. In the middle of the aerodrome is one of the three tents which were demolished by the converging bombing attack of No. 404 (Fleet Fighter) Flight.—(*"Aeroplane" photograph.*)

DO NOT FORGET THE R.A.F. DISPLAY ON JUNE 28.

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with the usual S turn, to get a clear view of everything in the upwind direction, he took straight off into the wind without noticing that there was a steam-roller directly in the line of take-off. The machine hit the top of the cab of the roller, turned upside down over it and caught fire.

The Air Ministry regrets to announce that as the result of an accident at Farnborough, Hants, to a Bristol Fighter machine of the School of Photography, Farnborough, on June 18, 1930, Flying Officer John Cecil Lauga Claxton, the pilot and sole occupant of the aircraft, was killed.

At the Inquest at Aldershot on June 19 Wing Cdr. F. C. Laws said that he thought that Claxton might have made a mistake when changing from one petrol tank to another as he opened the throttle fully. The engine might have been starved for petrol.

Fighter Squadron Markings.

The following information will enable readers of The Aeroplane to identify Fighter Squadrons at the R.A.F. Displays. The markings are painted on the side of the fuselage and along the upper side of the top plane of each machine.

No. 1 Squadron:—Two red bars with a white bar between them, all bars of equal width.

No. 3 Squadron:—A green bar.

No. 17 Squadron:—Two black parallel zig-zag stripes.

No. 19 Squadron:—A double row of blue and white squares.

No. 23 Squadron:—A single row of blue and red squares.

No. 41 Squadron:—A red bar.

No. 43 Squadron:—A double row of black and white squares.

No. 54 Squadron:—A yellow bar.

No. 56 Squadron:—A double row of red and white squares.

No. 111 Squadron:—A black bar.

Group Captain Burdett.

Group Captain Burdett, D.S.O., has been placed on the Retired List at his own request. He was seconded to the Royal Flying Corps from The York and Lancaster Regiment in June, 1914, and went to France on the outbreak of War with No. 2 Squadron.

An account of his Service career appeared in The Aeroplane of Feb. 29, 1928, on his appointment to command No. 21 Group, R.A.F.

He has recently been appointed Secretary of the Royal Air Force Club in place of Capt. Wynyard Wright, who is now secretary of Boodle's.

Civilian Stores Officers.

An Air Ministry Order states that a number of vacancies for civilian stores officers have arisen and others may arise at home and overseas units. The appointments are at Civil Service rates of pay, with a foreign service allowance for those appointed for duty overseas.

Applications from officers on the retired list or on the reserve who have had service as stores officers in the R.A.F. and are familiar with the stores-accounting regulations are invited and should be addressed to the Secretary, The Air Ministry.

The Study of Modern Languages.

An Air Ministry Order states that the following airman passed the Colloquial Arabic examination in January, 1930, and his name therefore should be added to the list of successful candidates:—No. 361992 L-AC. J. J. T. Harrison.

The Andover Display.

Air Vice-Marshal Sir John Steel and the Officers of the Royal Air Force Station, Andover, were At Home on June 20, when the Guests were entertained with a display of flying by the R.A.F.

The Andover Display is not exactly a rehearsal of the R.A.F. Display at Hendon, but several of the events to be given at the Hendon Display are given at Andover.

The low clouds and heavy showers of fine rain so well known at Andover made one of the worst possible days for flying, and arriving guests were faced with a blackboard which informed them that the start of the programme had been postponed for half an hour and that unless the clouds, which were then at 500 feet, rose to at least 1,000 feet, most of the events would have to be cancelled. In spite of this ominous warning and the still more ominous weather the programme began punctually at 15.30 hours and continued without alteration or interruption to the end. Therefore both the warning, which may be attributed to the Staff College, and the display, which was the work of Units of the Air Defence of Great Britain, conformed with the Service tradition.

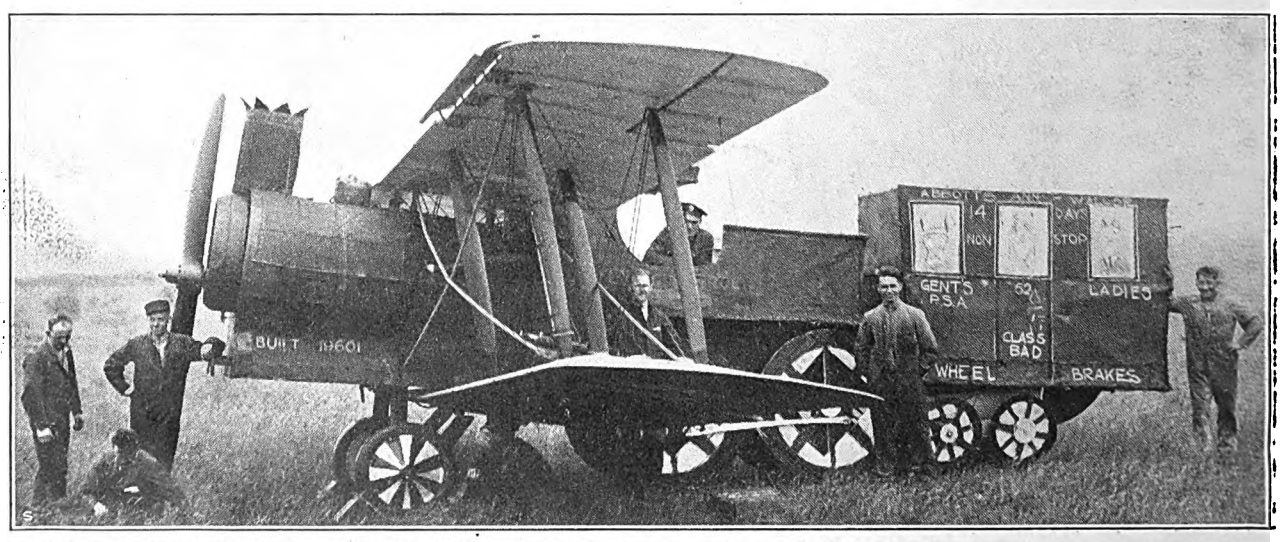
The first event was balloon-hunting by a Bristol Fighter (Rolls-Royce), which resulted in the demolition of a number of harmless toy balloons by this aggressive-looking aircraft. While the Bristol was in the air three Fighter and three Day Bomber Squadrons lined up on the aerodrome and, when the Bristol landed, took off by Squadrons in formation. They were No. 29 (Fighter) Squadron, No. 56 (Fighter) Squadron, and No. 111 (Fighter) Squadron, all with Armstrong Whitworth Siskins (Siddeley Jaguar): No. 12 (Bomber) Squadron, Fairey Foxes (Rolls-Royce or Curtiss) and No. 35 (Bomber) Squadron and No. 207 (Bomber) Squadron, both with Fairey III F's (Napier Lion).

The Squadrons disappeared into the clouds and an exhibition of inverted flying was given in an Avro training machine (Siddeley Lynx) of the Andover Station Flight. The skill with which this machine was handled gave an impression of leisurely ease which was in its way as delightful as the crazy-flying exhibitions usually given on these machines. As it landed the six squadrons came roaring out of the mist from the west and, after passing straight over they flew past in front of the spectators in squadron formation and quite low. They were a most impressive spectacle. The Fighters returned to their home stations without landing and the Bombers cruised around waiting for their next turn.

The programme announced that a demonstration of individual aerobatics would be given by two Siskins of No. 56 (Fighter) Squadron but actually only one of them went up. This was a particularly pleasing demonstration of the high standard of aerobatic training which is achieved in the fighter squadrons of the R.A.F. In this case the aerobatics were performed particularly near the ground which was appreciated by the spectators but more difficult for the pilot.

The evolutions by three Day Bomber Squadrons was carried out by the three squadrons which had taken part in the previous formation flying and consisted of the usual changing formation movements. Considering the weather they were remarkably steady and accurate.

For the Message-Picking-Up demonstration, which should



THE FLYING PETROL KETTLE.—This most amazing aircraft was built and taxied about the aerodrome by some of the airmen at the R.A.F. Display at Andover. It is actually a complete Bristol Fighter—and then some.—(*"Aeroplane" photograph.*)

DO NOT FORGET THE R.A.F. DISPLAY ON JUNE 28.

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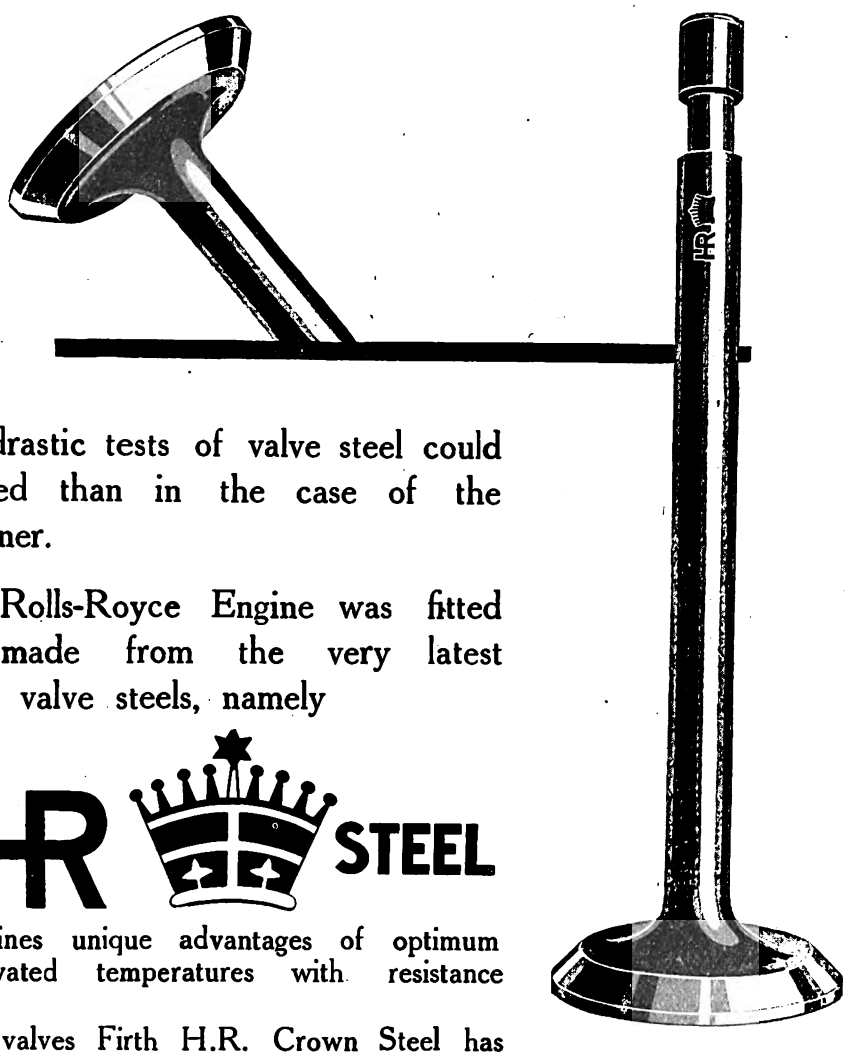
FIRTH VALVE STEELS
FOR THE SCHNEIDER WINNER



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have been done by six Armstrong Whitworth Atlases (Siddeley Jaguar) of No. 2 (Army Co-operation) Squadron, only one Atlas got through from Manston. The pilot of this machine did the job so well that the others were hardly missed. He made four runs and picked up the first two perfectly from a string across two posts. He missed it on the third run, through diving too sharply, but picked it up on the fourth. The return messages were dropped with remarkable accuracy, for each one fell within five yards of its mark.

For the Parachute Descents two Vickers Vimys of the new training type with Bristol engines went up with the parachutists on the wings. Two live pull-off drops were made from each machine but not enough allowance was made for the wind, and the parachutists all alighted in a wheat-field on the other side of the road which runs along the north boundary of the aerodrome.

The Air Combat between one Hawker Horsley (Rolls-Royce Falcon engine) of No. 100 (Bomber) Squadron and three Bristol Bulldogs (Jupitor engine) of No. 3 (Fighter) Squadron, was rather a heartless affair. The Horsley was practically cold meat from the beginning. However, some new and interesting air battle tactics were shown, and one of the Bulldogs was shot down "according to plan" before the Horsley gave in.

Six Handley-Page Hyderabads (two Napier Lion engines) of No. 10 (Bomber) Squadron then took off and flew past with loud and beautiful noise, after which came one of the best events in the Display. This was an exhibition of Squadron Aerobatics by No. 43 (Fighter) Squadron in Siskins.

The three machines of each Flight were roped together with rubber cords. The squadron manœuvred in beautiful formation backwards and forwards over the aerodrome and included a crossover-turn in their evolutions. The cords remained unbroken and were not even strained until the whole Squadron looped in formation, when one machine dropped back and the cord snapped. Anyway it was a magnificent display of accurate judgment and piloting.

[The left-hand formation was inclined to crowd in on the leading formation, so that at times the left-hand man of the leading formation had to drop back to avoid colliding with the right-hand man of the left formation.—C. G. G.]

After this all the machines of different types which the spectators had been allowed to examine at their leisure in the special park taxied past in line and then took off and flew past, diving in salute. They were a Bristol Fighter (Rolls-Royce), a Moth (Cirrus), a Fox (Curtiss D.12), a Fairey III F (Napier), a Bulldog (Jupiter), a Flycatcher (Jaguar), a Siskin (Jaguar), a Sidestrand (2 Jupiters), a Victoria (2 Napiers), a Hyderabad (2 Napiers), a Virginia (2 Napiers), a Ripon (Napier), and a Blackburn (Napier).

The most exciting event in the programme came last when four Fairey Flycatchers (Siddeley Jaguar) of No. 404 Fleet Fighter Flight from Donibristle made a converging machine-gun and bombing attack on a small group of three tents on the aerodrome. The dives were beautifully timed and the bombing astonishingly accurate.—C. M. MCA.]

Two More Caterpillars.

With reference to the accident at Upavon on June 12, in which Sjt. F. E. O'Meara lost his life, the pilot of the Bulldog, Plt. Off. Lord Malcolm Douglas-Hamilton, and the gunner of the Horsley, L-AC. W. Hagan, escaped by parachute.

No Sex Appeal in the R.A.F.

In the House of Commons on June 17, Mr. Holford Knight asked the Under-Secretary of State for Air for what reason facilities had been refused to a British film company for making a film which had been sponsored by the "Imperial Air League," about the Indian Air Mail and the work of the R.A.F. in guarding its routes?

Mr. Montague replied that the Secretary of State for Air was opposed to the participation of officers and other ranks of the R.A.F., under orders, in the making of films which inevitably involved a pseudo-romantic and theatrical atmosphere entirely unsuited to their profession and traditions. No scenario as yet submitted to the Air Ministry, including that under reference, had been free from these drawbacks.

[Mr. Montague's decision and Lord Thomson's opposition will be received with gratitude and commendation by all right-thinking people.—ED.]

No. 56 Squadron Re-Union.

A re-union dinner of No. 56 (Fighter) Squadron, R.A.F., will be held at North Weald, Essex, on July 18. Any officer who has served with this Squadron and who has not already received an invitation is invited to apply for particulars to the Officer Commanding No. 56 (Fighter) Squadron, North Weald, Essex, who will arrange accommodation for the night if required.

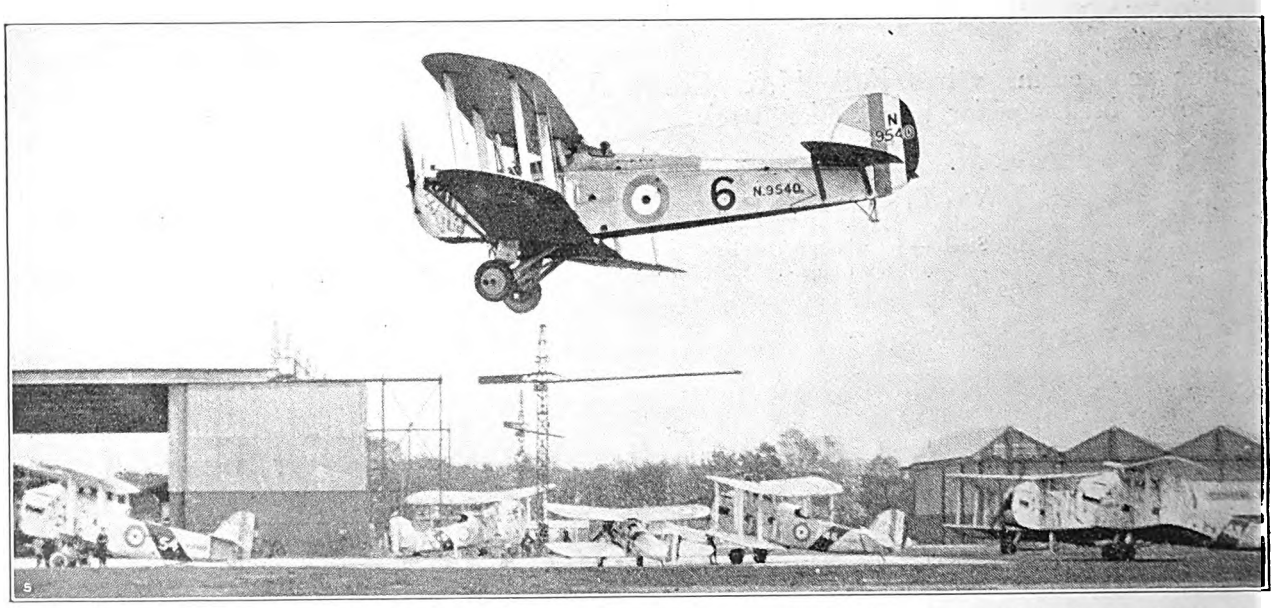
FROM STALL TO HITCHING POST.

R.101 was taken from her shed at Cardington in the early hours of Monday, June 23, and walked across to the mooring mast in a steady wind of 11 miles per hour, which luckily blew lengthwise of the shed. The airship will make several flights during the week and may appear at the R.A.F. Pageant on Saturday.

LIEUTENANT-COLONEL RABAGLIATI.

Lieut.-Col. C. E. C. Rabagliati, M.C., late R.A.F., who was very seriously injured when the racing car which he was driving at Brooklands about seven weeks ago overturned was sufficiently recovered to leave the Weybridge Hospital on June 19.

Lieut.-Col. Rabagliati went to France on August 14, 1914, with No. 5 Squadron Royal Flying Corps. He was at that time a Lieutenant in the Yorkshire Light Infantry, attached to the R.F.C. for duty as a Flying Officer. He was awarded the Military Cross in 1915 for gallantry in action and retired from the R.A.F. in 1919 with permission to retain the rank of Lieutenant-Colonel. Of late years he has been intimately concerned with the insurance of aircraft, and is a member of the British Aircraft Insurance Group.



TORPEDO CRAFT.—A Blackburn Dart (450 h.p. Napier Lion engine) flying over a variety of coastal defence aircraft at the R.A.F. Base, Gosport—a few weeks ago. The Dart is the equipment of a number of Fleet Torpedo Bomber Flights and of the Base Torpedo Section, Gosport.—(*"Aeroplane" photograph.*)

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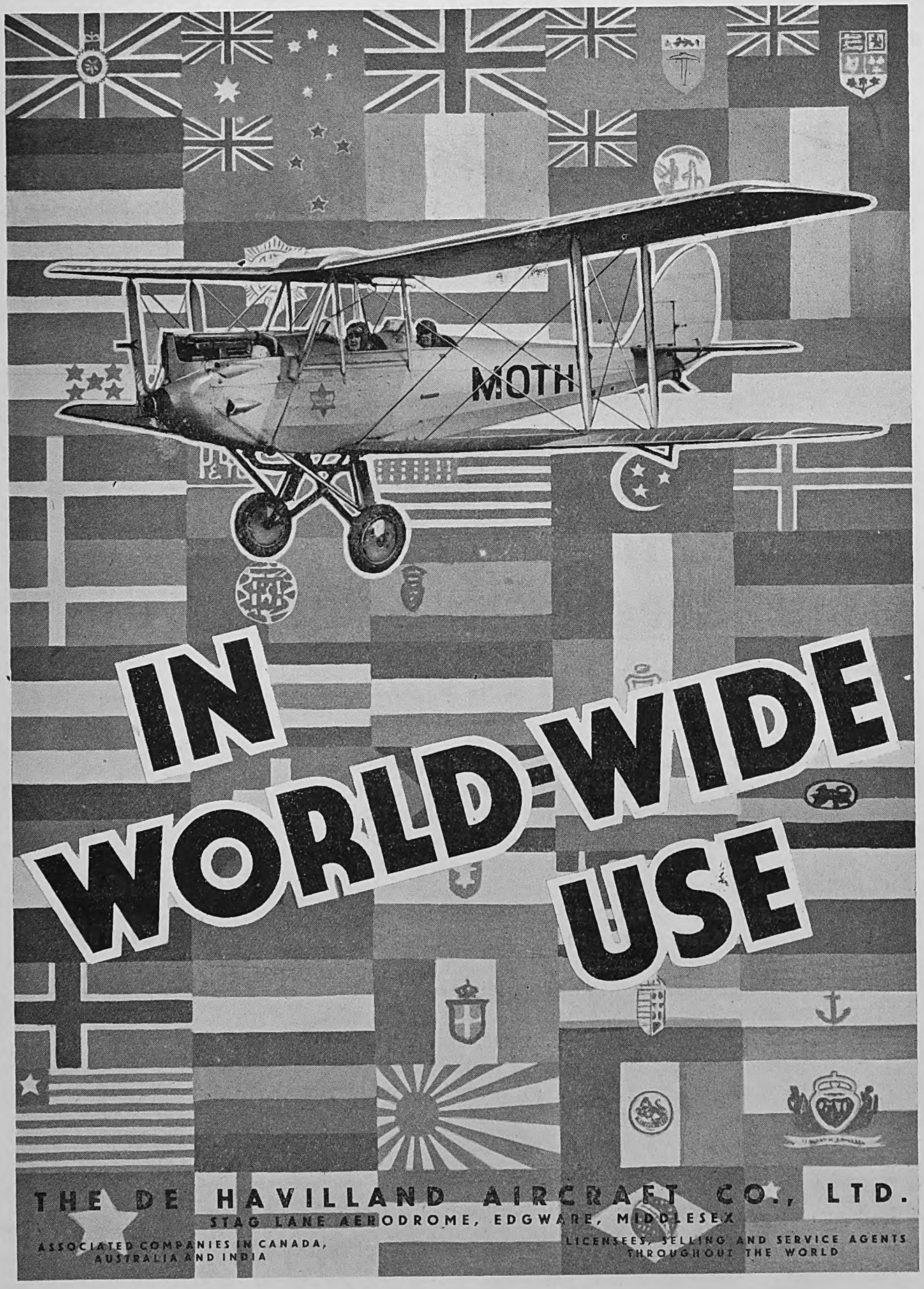

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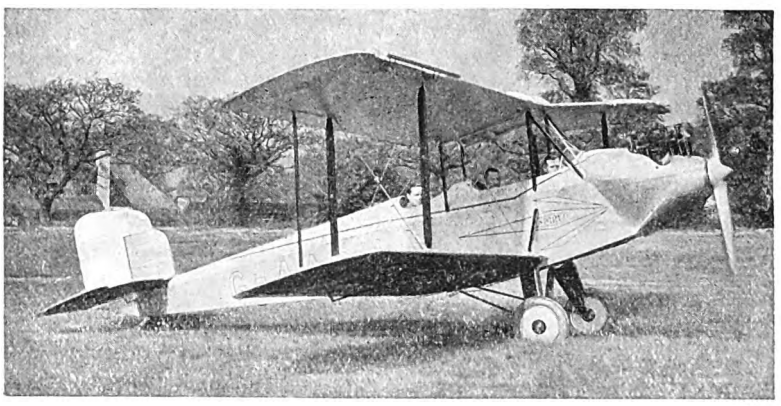
THE 3-SEATER SPARTAN



Outstanding . . . in performance and strength of construction . . .

The three-seater Spartan with a Cirrus-Hermes engine is a type which is unique among light aircraft and possesses all the qualities required for joy-riding or taxi work. The short landing and take-off runs reduce taxying between flights to the minimum, and the ease of ingress and egress still further cuts down the time spent on the ground. The rugged strength characteristic of all Spartan aircraft lowers maintenance costs, and makes this three-seater particularly suitable for the continuous landings demanded of joy-riding machines. The three-seater Spartans already in use for joy-riding have proved the value of these features, and shown their operators a considerable increase in the ra io of takings to total working hours as compared with other types.

The ideal joy-riding machine.

SPARTAN AIRCRAFT, LTD.

WESTON, SOUTHAMPTON.

Aeromarine.

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THE ARMSTRONG WHITWORTH AND ARMSTRONG SIDDELEY SUPPLEMENT.

ON THE ARMSTRONG WHITWORTH AND ARMSTRONG SIDDELEY FIRMS.

Among the various important manufacturing firms which constitute the British Aircraft Industry, an industry which has been recognised by Cabinet Ministers of all parties as one on which the safety of this country in time of war very largely depends, none have had a more remarkable history than that group which is included in the Armstrong Siddeley Development Co. Ltd. This group, which is controlled by Mr. J. D. Siddeley, comprises Sir W. G. Armstrong Whitworth Aircraft Limited, Armstrong Siddeley Motors Limited and A. V. Roe and Co. Ltd. In this particular supplement to THE AEROPLANE we are only concerned with the two firms first mentioned. Therefore we may turn our attention directly to them.

Though Mr. J. D. Siddeley dislikes personal publicity, no history of this group of firms, which is undoubtedly the biggest financial undertaking in this country concerned wholly with the manufacture of aircraft, could be complete or properly explanatory without some account of Mr. Siddeley's engineering experience before he became concerned with aircraft. Moreover, his successful connection with aircraft demonstrates more conclusively than do the histories of most men and firms in this trade the direct descent of aeroplanes and airships through the motor trade from that mildly despised vehicle the bicycle,—which was in fact the first engineering product to show the World how lightness and strength may be combined in a transport vehicle.

The present writer may perhaps be forgiven for emphasising this fact because he himself learned the possibilities of steel in light structures from serving in the Cycle Trade for a long time before those who are motor engineers to-day began to appreciate how lightly steel structures can be built when properly designed.

A PERSONAL REMINISCENCE.

Mr. Siddeley's career as an engineer began in 1892, when he was a draughtsman at the Humber Cycle Co. in Coventry under Mr. P. L. Renouf, who was quite one of the most original engineers of his day. Mr. Siddeley transferred to the Rover Cycle Co., a firm whose name is still World-famous both for cycles and cars, in 1896. The present writer had joined the Swift Cycle Co. in 1895, so naturally we met in those early days, for Coventry was then a small place, and the people in one firm generally knew their opposite numbers in rival firms, much as they do in the Aircraft Trade to-day.

The first Siddeley Motor Cars were produced in 1902-03—which was about as early as could be in the history of motoring, and shows how well Mr. J. D. Siddeley in those days was able to judge the trend of developments. In the years 1904-05 the Siddeley cars were made by the Wolseley Motor Company, which had been developed from the Wolseley Sheep-Shearing Machine Co. Ltd., and belonged to Vickers Ltd. The manager was Mr. Herbert Austin, now better known as Sir Herbert.

These cars soon became famous under the name Wolseley-Siddeley. Though they did not profess to be speed cars they were acknowledged as vehicles of the first class and were particularly noted for the fact that they were designed as gentlemen's carriages and were adequately equipped for comfort and security as well as having speed and power.

Nevertheless some of the early Wolseley-Siddeleys won important speed events. And one of them was still going strong at Brooklands in 1912 or so.

While producing the Wolseley Siddeley car Mr. Siddeley came into contact with Aviation for the first time, for in 1908 he undertook the design and production of an aero-engine for Mr. Dunne, who at that time was making his first experiments with an inherently stable aeroplane. And, be it said, these early 4-cylinder Vee-type Wolseley-Siddeley aero-engines gave extraordinary power for their weight, judged by the standards of that day. From that early connection with flying came, during the War 1914-18, the Wolseley-built aero-engines called the Viper, which did good service in S.E.5a's. and have since ceased to exist except as "disposals" stock.

In 1909 Mr. Siddeley left the Wolseley Company to found in Coventry a new firm called Siddeley Deasy Motors Ltd., to manufacture with a free hand cars which embodied all his own ideas of what a proper road-carriage should be. Those who remember the Siddeley Deasy car will remember that it always looked well and it always ran well. Without catering for the sporting section of the motoring public the firm acquired a public of its own which was very well pleased with the products of the Siddeley Deasy Factory.

WAR WORK.

When War broke out in 1914 the Siddeley Deasy Company undertook the production of the 12-cylinder air-cooled engine designed by the Royal Aircraft Factory as an enlarged version of the then notorious 90 h.p. 8-cylinder Raf engine. This engine, thanks to the skill of the Siddeley engineers, became one of the best engines produced in this country. At first it was used in specially-built biplanes (the B.E.12) for chasing Zeppelins at night. And towards the end of the War the 120 h.p. Raf was the standard power-plant of the very much improved R.E.8s, which did so much good service as artillery-observation machines.

In 1914, also, the Siddeley firm undertook to build aeroplanes, and produced the first of the R.E.7s,—which were later developed into the R.E.8. And those War-time pilots who were on artillery co-operation duty towards the end of the War will remember that the Siddeley-built R.E.8s were among the best of their class.

Somewhere about 1916 the Siddeley Motor Co., having done so well in developing the 12-cylinder Raf engine, were given the job of developing the B.H.P. engine. Development in this case meant complete alteration of the basic design, and the engine ultimately produced from the Siddeley works was the famous Siddeley Puma, which did most valuable work towards the end of the War and was the mainstay of the first years of British Civil Aviation.

Even to-day the Puma is an engine of outstanding merit, as is proved by the fact that only a week or so ago an aeroplane with a Siddeley Puma, which cannot have been less than twelve years old, flew from London to Madrid in one day and, after allowing the passenger to transact his business, flew back from Madrid to London in another day.

In 1917 Major F. M. Green, of the Royal Aircraft Factory, joined the Siddeley Company for the special purpose of developing radial air-cooled engines. How far the firm's ideas had advanced is shown by the fact that in 1917 an

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experimental Siddeley radial engine was produced which had 14 cylinders and a supercharger.

Before the Armistice the firm had already produced some experimental aeroplanes of its own design and was interesting itself in steel construction. The result was that shortly after the War was over the first Siddeley Siskin was produced and this machine, now made by Armstrong Whitworth Aircraft Ltd., is the type most largely used by the Single-seat Fighter Squadrons of the Royal Air Force.

POST-WAR DEVELOPMENTS.

Shortly after the end of the War, when all kinds of interchanges of financial interests were taking place, Sir W. G. Armstrong Whitworth Ltd., the great Newcastle engineering firm, acquired an interest in what had then become known as Siddeley Motors Limited. This was the first link with the Armstrong name.

Before the War and during the War Sir W. G. Armstrong Whitworth Ltd. had made aircraft which were very successful. In fact, the Armstrong Whitworth biplane which was designed and built in 1914 was the only type of aeroplane in the World which was used on active service from the beginning of the War till the end. There was, therefore, a natural affinity between the aircraft department of the Armstrong Whitworth firm and the aero-engine business of Armstrong Siddeley Motors Limited.

After various stages in development of the aircraft department Mr. Siddeley took over on his own account all the aircraft interests of the Armstrong Whitworth firm. And in this way Sir W. G. Armstrong Whitworth Aircraft Limited and Armstrong Siddeley Motors Ltd. came under the personal control of Mr. J. D. Siddeley, as head of the Armstrong Siddeley Development Co. Ltd. And, be it said, both the aircraft concern and the aero-engine concern have been remarkably successful ever since.

Before the amalgamation with the Armstrong Whitworth aircraft department the Siskin biplane had already achieved a considerable amount of fame. And,—showing how hard custom dies,—even to-day people in the Royal Air Force still habitually call the machine the "Siddeley Siskin," when in fact its proper name is the "Armstrong-Whitworth Siskin." One can only hope that the descriptive matter which appears hereafter in this number will make clear once and for all the difference between the two firms, although they are in the same group.

METAL CONSTRUCTION.

Towards the end of the War 1914-1918 a great deal of attention had already been paid to the production of all-metal aircraft. The argument, which is still not ended, between steel and aluminium alloys and between tube and strip material had begun.

Mr. Siddeley, with his usual foresight, had investigated all these questions before the Armistice, and had, in fact, acquired a number of patents covering various methods of using high-tensile strip steel,—which patents are day by day, even now, proving more conclusively their high value. And Major Wyllie, who was responsible for many of the early patents covering this system of construction, is now in the employ of Armstrong Whitworth Aircraft Ltd. and is still inventing new and improved methods of dealing with strip-steel in the construction of aircraft. Some of these new methods will be found described hereafter.

The Armstrong Siddeley aero-engine works, which are in the same main building as the famous Armstrong Siddeley motor cars, turned their attention, as already mentioned, before the end of the War, to the production of radial air-cooled engines. The result is that to-day the firm have the widest range of air-cooled engines of any firm in the World. They run all the way from the Genet engine of about 80 h.p. up to the Leopard, which is now giving over 800 h.p.

The types which are at the moment most generally used are the Genet-Major of about 110 h.p., the Mongoose of 150 h.p., the Lynx of about 220 h.p. and the Jaguar of 500 h.p.

The quantities of Jaguar engines which are in daily use in the Royal Air Force, and the high opinion of the engine which is held by the pilots, are the best proofs of its quality. The Lynx has distinguished itself by its use in the R.A.F.'s Avro training machines and by a number of voyages from Holland to the Netherlands East Indies and back, and by numerous other voyages in three-engined Fokker monoplanes. And the Genet-Major has already proved itself to be among the most efficient of small engines for light aeroplanes. Lastly, the Mongoose, the least-known of all the series, seems likely to do great things in the Avro Trainer and in the new Hawker Tom-tit training machine.

Armstrong Whitworth Aircraft Ltd. have very large works, beautifully situated alongside their own aerodrome on Whitley Common, just outside Coventry. It is one of the most charming situations for a factory that can be imagined. And the shops are certainly as well laid out and as well-equipped as any workshop in the World. Some American factories may be bigger, thanks to the boom in American aircraft, which has recently burst, but certainly none is better equipped or better organised. And certainly in no foreign factory are the uses of steel structures so well understood.

The most recent success of the Armstrong Whitworth aircraft works is the Atlas biplane, which has been adopted by the Royal Air Force as the standard type for Army Co-operation work. This machine, with a Jaguar engine, has a very high performance for a general purpose machine of its kind. And it is said to be one of the easiest aeroplanes in the World to fly.

When one visited the Armstrong Whitworth works recently one saw a number of interesting new types of aeroplanes which have recently been produced to Air Ministry specifications. These may not be mentioned by name nor described as types. But one is at any rate at liberty to say that new types are coming through which demonstrate conclusively that Sir W. G. Armstrong Whitworth Aircraft Limited are determined to hold the place in the Aircraft Industry which has been won for them in the past by the Siskin and the Atlas aeroplanes.

Undoubtedly the most interresting feature in the Armstrong Whitworth works is the way in which steel strip is heat-treated and tempered and thereafter worked up into all kinds of strange but clever shapes which are required to build all-steel aeroplanes. This process of heat-treating, and the various methods of rolling by which the desired sections are made, are described hereafter by Mr Bridgman. Nothing is more ingenious, and at the same time nothing more effective has been evolved in any class of manufacture.

TECHNICAL METHODS.

The Armstrong Whitworth methods are undoubtedly expensive at first. The cost of the special tools and the special rolls and so forth is heavy, and could not be afforded if only a few parts were required. But the whole system of manufacture has been designed with mass-production in view, so that on the outbreak of war the system can be adapted to factories which are not primarily aircraft factories at all. Its combined ingenuity and simplicity make it eminently suitable for such a policy. And one believes that by developing this system of construction the Armstrong-Whitworth aircraft works have done a real service to the nation in providing for mass-production of aircraft in case of war.

Considering the necessarily small output of war machines in these days, Sir W. G. Armstrong Whitworth Ltd. maintain a very large technical staff. They have an excellently equipped aero-dynamic laboratory with a big wind-tunnel. And they have an equally well-equipped laboratory for experimenting with materials, especially their favourite strip-steel.

All this technical equipment necessarily adds to the price which the tax-payer has to pay for individual war machines. But the extra cost is well expended when one considers it as a species of insurance policy which assures us against being let down for supplies of aircraft in another war as we were at the beginning of the War 1914-1918.

CIVIL AVIATION DEVELOPMENTS.

We must remember also that on the civil side Armstrong Whitworth Aircraft Ltd. have done good service to the nation. We have been told on various occasions by various authorities, such as Sir Samuel Hoare, the recent Conservative Secretary of State for Air, and by Lord Thomson, the present Secretary of State for Air, and by the chief officials of Imperial Airways Limited, our one and only subsidised air line, that the Armstrong Whitworth Argosy is, so far as can be discovered, the only aeroplane in the World which can pay for its own keep as an ordinary transport vehicle.

The amount we pay in subsidy for our air-mail and passenger service is proportionately less than is paid in subsidies to air transport firms in any other country which possesses aircraft. And this fact is largely attributed by the authorities on the subject to the fact that the Argosy with its Jaguar engines is capable of lifting a greater pay-load in proportion to its power than is any other aeroplane at present in use.

Thus we see that whether for war or for peace the products of Sir W. G. Armstrong Whitworth Aircraft Ltd. and of Armstrong Siddeley Motors Ltd. are doing good service to the nation. And from personal observation one can vouch for the fact that those who are in charge of the technical progress of these firms will not let them lag behind in the modern race for efficiency. Mr. Siddeley has collected a highly efficient staff not only of technicians but of production engineers and they in turn have collected workmen of as good class as one has seen during a workshop experience of something over thirty-five years. The quality of the material and the quality of the workmanship turned out by these two shops is fully up to the highest standard set in British Industry.—C. G. G.

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ARMSTRONG WHITWORTH AIRCRAFT.

Sir W. G. Armstrong Whitworth Aircraft Ltd. have been pioneers in the manufacture of steel aircraft in this country and until quite recently this firm were the only producers of steel aircraft in series.

The company has of late specialised on three types of aircraft, the Siskin Single-Seat Fighter biplane, the Atlas Two-Seat Army Co-operation biplane and the Argosy three-engined 20-passenger cabin biplane for civil use.

The first two are standard equipment in the Royal Air Force and the last-mentioned has been built to the requirements of Imperial Airways Ltd. The Argosy has shown that it has the greatest earning capacity of any civil aircraft yet produced, and it has gained an unsurpassed reputation for reliability, safety, and low cost of upkeep over a period of three years on the European routes of Imperial Airways.

The Armstrong Whitworth Siskin.

Sir W. G. Armstrong Whitworth Aircraft Ltd. began experiments in steel construction in 1917. The first aeroplane made by this company, in which the whole of the structure was of steel, was flown in 1918, and this machine was the first experimental Siskin single-seat fighter.

The Siskin I naturally underwent a long period of development, but in 1923 the Mk. III version went into production to provide new fighter equipment for the Royal Air Force.

The Siskin, apart from embodying the Armstrong Whitworth system of steel construction, incorporates several interesting points in design to fit it for fighter duties.

The requirements of a fighter aircraft are exacting and call for good visibiity, manœuvrability, a high, all-round performance, and, as nearly as may be, immunity against attack by enemy aircraft.

The Siskin has a big upper wing and a small lower wing and the pilot is so seated that his eyes are on a line with the chord-line of the upper wing. He can therefore see above and below the upper wing and, because of the position of the small lower wing, there is comparatively little to interfere with his view downward and forward.

On account of its good control and inherent stability the Siskin is extremely manœuvrable and easy to fly and its great strength ensures safety even in the most violent manœuvres.

According to the type of Jaguar engine fitted (which may be either of the plain or geared or supercharged or geared and supercharged types) the best performance may be obtained either near the ground or at heights of from 15,000 to 20,000 ft.

From the point of view of invulnerability the Siskin incorporates an interesting system of wing bracing.

Instead of duplicating the main flying-wires between the planes, from the bottom fuselage rails to the top interplane strut fittings, the duplication is achieved by having one wire between the points mentioned and a second flying-wire from the rigid members of the undercarriage to the under-surface of the lower plane at a point directly under the bottom interplane strut fitting.

The whole bracing system is perfectly triangulated and the efficiency of the system is such that any one flying wire on either side may be shot through without danger to the aircraft.

As has already been mentioned the Siskin is of all-metal construction except for the covering, which is of fabric. The main planes are of unequal span and chord and are interconnected by splayed-out Vee struts, one on either side of the fuselage.

The upper plane is built up of two spars of steel strip and the usual former-ribs, and the lower plane is built round a single tubular spar.

The top plane spars each comprise two lengths of rolled steel strips, which form the webs to which are fitted top and bottom flanges also of drawn strip. The assembly is completed by the turned-over edges of the webs and flanges being rivetted together.

The ribs are built up of drawn steel tubular-section booms interconnected by diagonal pressings of trough section. These are attached to the booms by wrap plates and rivets.

The fuselage is of tubular construction and is built in two main sections and jointed immediately aft of the pilot's cockpit. The fuselage is assembled by mechanical joints and is braced by swaged tie-rods.

The tail unit is of metal construction and that of the tail plane is similar to that used for the top main planes. The tail plane is adjustable in the air.

The undercarriage is of the oleo type and consists of a pair of oleo-legs which carry at their bottom ends a single tubular axle. Two horizontal radius-rods attached to the rear of the axle are anchored to the apices of a pair of rigidly-braced Vees aft of the oleo-legs. To the apices of these two rigid Vees the secondary flying-wires, already described, are also anchored.

The pilot's cockpit is situated under the trailing edge of the upper plane, where the maximum view is provided.

The armament consists of two fixed Vickers guns firing forward through the air-screw. Other equipment includes high-pressure oxygen equipment, full electrical installation, which provides for lighting and heating, and a short-wave R/T or radio-telephony installation, racks for four 20-lb. bombs, signal pistol and cartridges, parachute, safety-belt, fire-extinguisher, and provision is made for the installation of a camera-gun on the top plane for fighting instruction.

The Siskin is also supplied as a two-seater for instructional purposes. In this machine the military equipment is taken out and an extra seat is provided aft of the standard cockpit. This machine is fitted with the standard unsupercharged Jaguar engine and has a performance which is practically identical to that of the standard single-seat Siskin with the same engine.

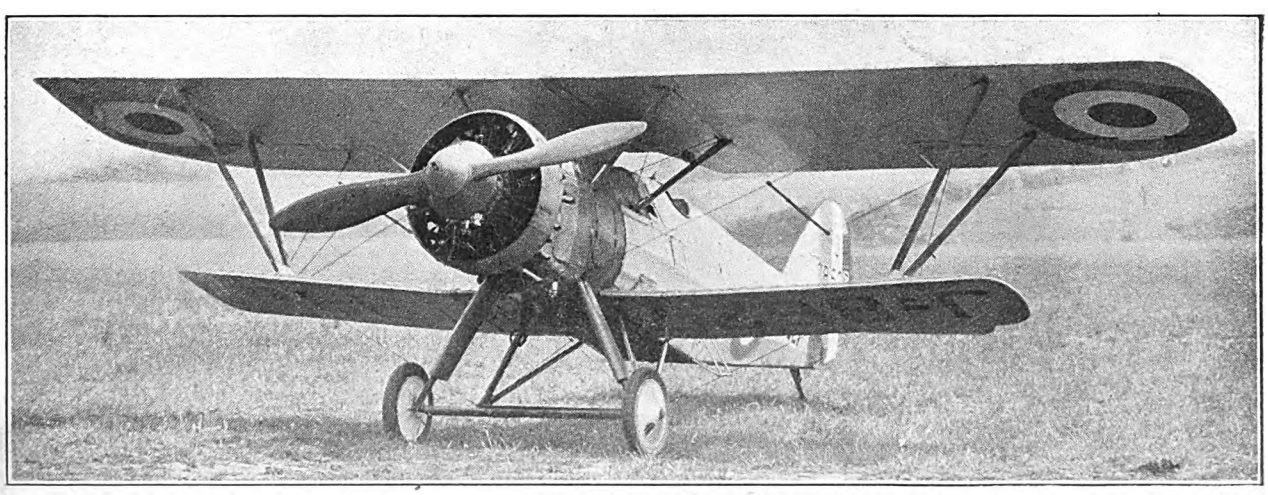
The Armstrong Whitworth Atlas.

The Atlas is a two-seat military biplane which has been adopted by the Royal Air Force as the standard two-seat aircraft for Army Co-operation.

The construction of this machine will be found hereafter described in the article entitled "Metal Aircraft Construction," on page 1212, and its general appearance may be gathered from the illustration.

For Army Co-operation duties the Atlas is fitted with an elaborate equipment which includes two guns, one firing forward and one aft, camera, complete wireless equipment, message pick-up apparatus, etc. It can also be arranged for use as a bomber or a long-distance reconnaissance machine, for which extra tanks may be fitted.

The Atlas is also supplied to the R.A.F. as an advanced



The Armstrong Whitworth Siskin IIIB single-seat fighter biplane (Armstrong Siddeley Jaguar engine).
L'Armstrong Whitworth Siskin IIIB biplan monoplace de combat (moteur Armstrong Siddeley Jaguar).
El Armstrong Whitworth Siskin IIIB biplano monoplaz de combat (moteur Armstrong Siddeley Jaguar).

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A batch of Armstrong Whitworth Atlas two-seat Army Co-operation biplanes (Armstrong Siddeley Jaguar engines) awaiting test at Whitley.
Un groupe de biplans biplaces Armstrong Whitworth Atlas de Coopération avec l'Armée (moteurs Armstrong Siddeley Jaguar) en attendant leurs épreuves à Whitley.
Un grupo de biplanos biplazas Armstrong Whitworth Atlas de Cooperación con el Ejército (motores Armstrong Siddeley Jaguar) esperando sus pruebas en Whitley.

training two-seater. For this purpose the military equipment is deleted and the back cockpit is fitted up as an exact replica of the front cockpit. The instructor may sit in either cockpit so that the pilot under instruction may accustom himself to flying the machine from the pilot's cockpit before he makes his first solo flight.

The Atlas has many other applications other than that of Army Co-operation. With the Jaguar-Major engine, either of the plain or supercharged type, it becomes a formidable two-seat fighter with a high all-round performance. It can also be made into a high-speed bomber by the addition of suitable equipment.

It has also been equipped as a seaplane with a pair of metal floats and a geared Jaguar engine. (See front of cover.)

The advantages of using a single type of aircraft for a number of different duties cannot be over-estimated. It results in a large reduction in the number of spare parts to be kept in stock and the pilots and mechanics become accustomed to handling and maintaining one type.

The Armstrong Whitworth Argosy.

The Argosy was the first commercial aeroplane built by Sir W. G. Armstrong Whitworth Aircraft Ltd., and a number of machines of this type have now been in use on the European routes of Imperial Airways Ltd. for several years with unqualified success.

The power plant consists of three geared Jaguar engines one mounted in the nose of the fuselage and one on each side of the fuselage between the wings. The main fuel tanks, with a total capacity of 360 gallons, are mounted under the centre-section and give gravity feed to the engines.

The passenger cabin has seating accommodation for twenty passengers,—ten on either side of a central gangway. Each individual seat has an openable window and the cabin is adequately heated, lighted and ventilated. Ample baggage space is provided in two separate compartments and full wireless, navigational and night-flying equipment is installed.

METAL AIRCRAFT CONSTRUCTION.

Sir W. G. Armstrong Whitworth Aircraft Ltd. are the pioneers in the development of steel aircraft, and for the past seven years they have been producing steel aircraft in numbers for the Royal Air Force.

The Armstrong Whitworth Siskin single-seat fighter and the Armstrong Whitworth Atlas two-seat Army Co-operation biplane are both standard R.A.F. types. The Siskin forms by far the largest proportion of the single-seat fighter equipment of the R.A.F. and since its introduction there have been no accidents to this type of machine which have been traceable to structural failure.

The construction of these two types of aircraft is very similar and they embody the very latest methods of steel construction that has been developed by Sir W. G. Armstrong Whitworth Aircraft Ltd. in twelve years' intensive development.

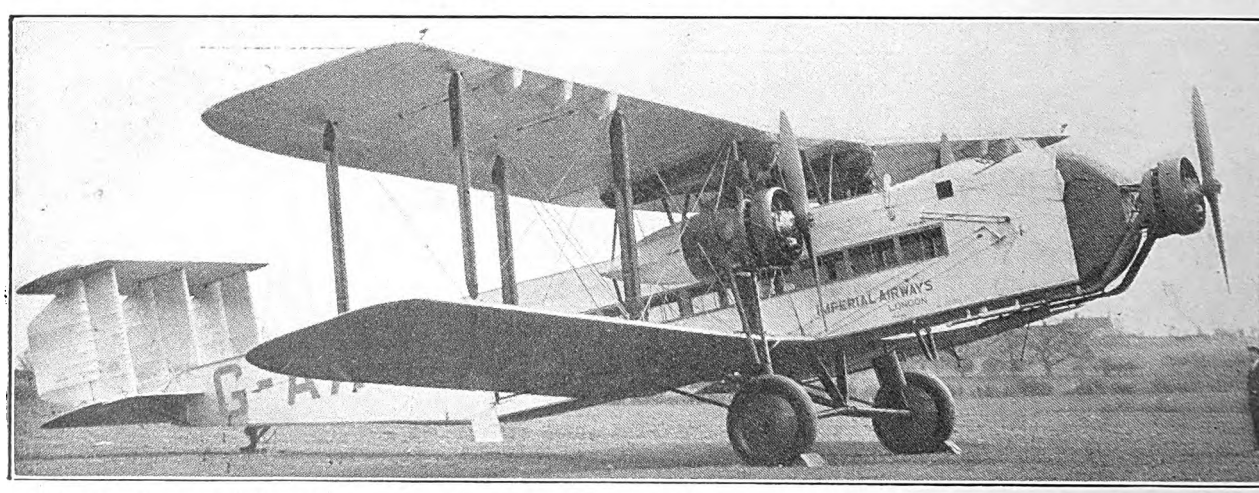
The system of construction evolved combines the qualities of extreme lightness and adequate strength. In addition the mode of assembly lends itself admirably to ease of repair and maintenance, essential qualities for aircraft which have to operate far away from their base.

The use of steel as a constructional material has many advantages. Primarily, in England, where the best steels are made, the qualities of this metal are well-known. Compared with light alloys, steel is a more durable and reliable material, it provides a wide range in choice of quality, it is admirably suited for manipulation into aircraft members, and finally it is very susceptible to treatment against atmospheric and other corrosive influences.

Hereafter follows a description of the methods used by Sir W. G. Armstrong Whitworth Ltd. in the construction of steel aircraft. In this case all components described belong to the Atlas two-seat biplane, but they may be taken as illustrative of the general methods employed by the company for their other types.

STEEL SPAR DESIGN.

The Atlas wings are built up of two spars and the usual number of former ribs, and the whole is covered with fabric.



The Armstrong Whitworth Argosy 20-passenger biplane (three Armstrong Siddeley geared Jaguar engines) as used by Imperial Airways Ltd.
L'Armstrong Whitworth Argosy, biplan à 20 passagers (trois moteurs Armstrong Siddeley Jaguar démultiplies) tel qu'il est utilisé par Imperial Airways Ltd.
El Armstrong Whitworth Argosy, biplano de 20 pasajeros (tres motores Armstrong Siddeley Jaguar desmultiplicados) tal como lo utilizan los Imperial Airways Ltd.

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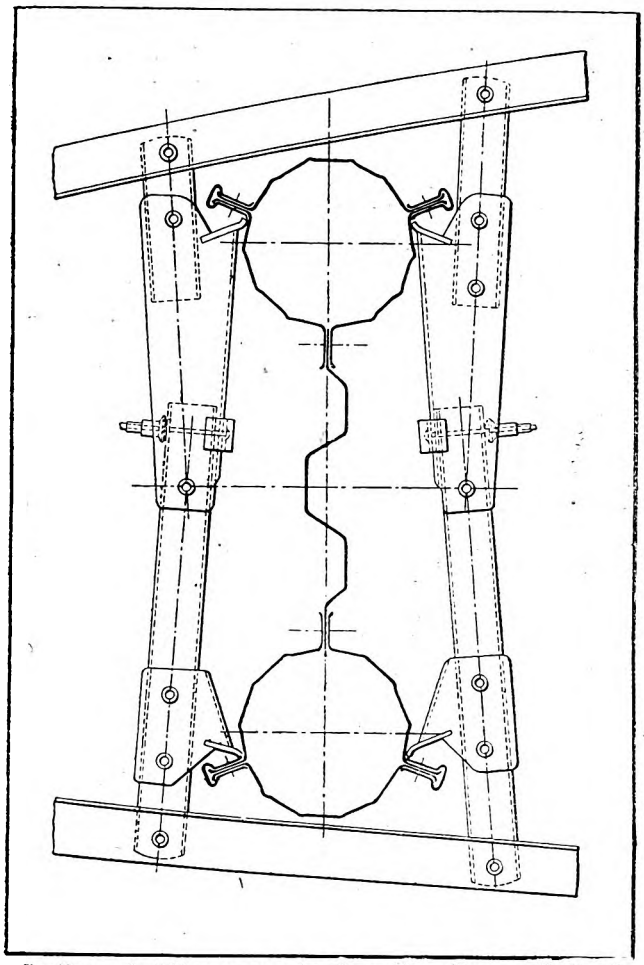


Section of Atlas spar showing also the method of attachment of the wing rib.
Section de longeron de l'Atlas montrant également le système de fixation des nervures d'aile.
Sección de larguero del Atlas mostrando también el sistema de sujeción del nervio de ala.

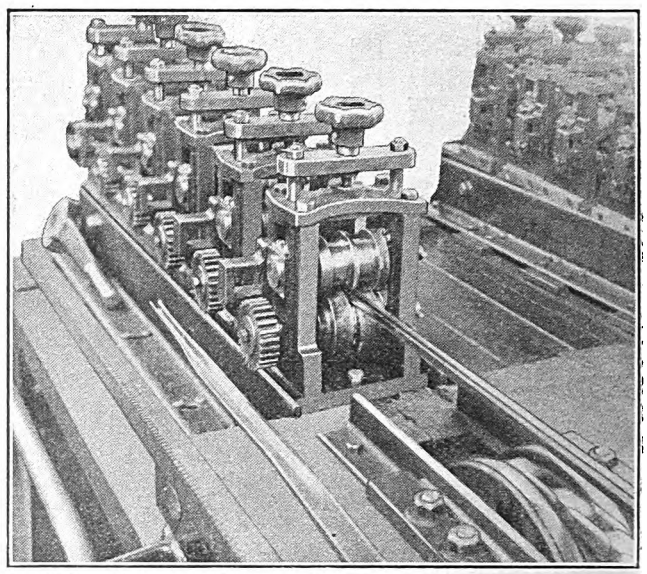
The main spars of the Atlas are made from steel strip varying from 0.01 to 0.02-inch thick and the depth of the top plane spar is 5½ inches.

The weight of this spar per foot is slightly under 0.855 lbs. and it will withstand a maximum fibre stress of 80 tons per square inch when built of heat-treated strips. This corresponds to a moment of resistance of 28 ton-inches, and compares favourably on a strength-weight basis with any other form of construction.

The Atlas spar consists of two built-up tubular booms connected by a corrugated web. Each boom consists of three identical segments, each of which has turned-up edges and four longitudinal flutes rolled in for longitudinal strength.

Two of these segments are rivetted to the web, one on each side. The final segment is assembled on the upturned edges of the first two segments, where it is held in place by two bulbous sections which grip the flanges of the sections, after which it is finally rivetted in place.

The corrugation of the web makes it capable of resisting



The rolling equipment for spar and rib sections.
L'installation de laminage pour les sections des longerons et des nervures.
La instalación de laminar para las secciones de largueros y nervios.

stresses 30 times greater than those of the plain strip. The corrugations consist of a series of troughs, all with flat sides and rounded corners. The width of the flats are about 32 times the thickness of the metal.

By these means strength is provided to resist wave formation under compression up to about 50 tons per square inch.

The spar sections are made from high tensile steel strip containing from 3 to 5 per cent. of nickel and 0.5 to 1.5 per cent. of chromium (to Air Ministry D.T.D. 54A specification) and are rolled in a 40- to 45-ton tensile condition. They are finally heat-treated to 80-90 tons per square inch by a procedure which is described elsewhere.

The sections are produced first by cutting wide lengths of steel into strips and then by drawing the strips through rollers, or by rolling, according to the section.

The strip-cutting is done by a special machine designed by Sir W. G. Armstrong Whitworth Aircraft Ltd. The coil of strip is mounted on a drum. The free end passes first through adjustable guides and thence between rollers which are fitted with disc-like cutters. These can be spaced to suit the width of strip to be cut. The cut strip is fed onto a second drum, and when two strips are cut simultaneously the second strip passes to a third drum.

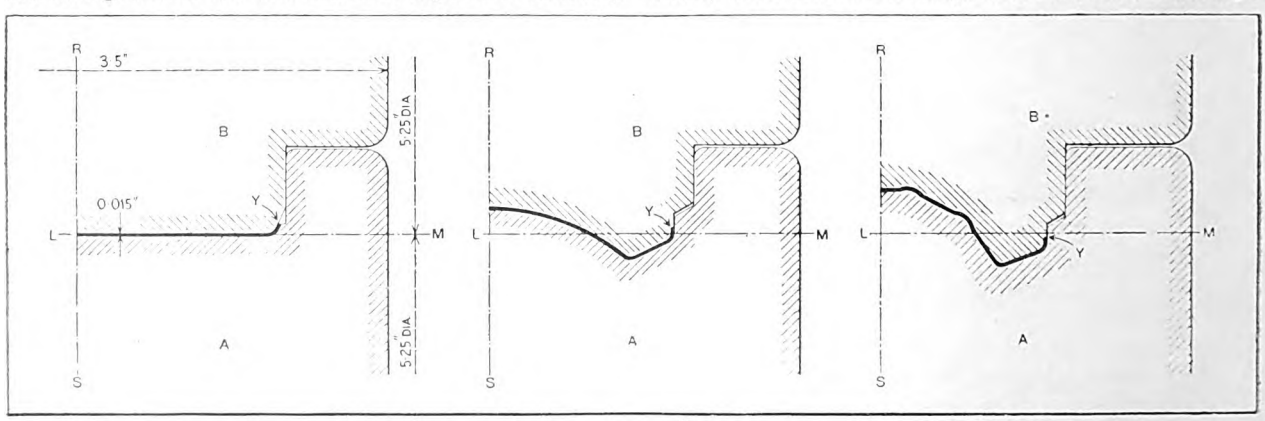
This drum may also be used to coil the waste ends from the original coil.

The motive power is supplied by an electric motor which drives the second drum so that the material is drawn through the slitting rollers. The cutting speed of this machine is 20 feet per minute.

The strip is then rolled to the required cross-section on a Roll Drawing Machine, which has also been designed by Sir W. G. Armstrong Whitworth Aircraft Ltd.

This consists of a series of six roll housings which are mounted at one end of a draw-bench 21 feet long and 18 inches wide. The roll housings are so mounted on their base that they may be adjusted laterally and vertically.

An endless chain runs down the middle of the draw-bench, and above this on angle-iron rails runs a carriage, at



Details of the rolls used to develop the spar segment section.
Détails des rouleaux utilisés pour développer la section du segment de longeron.
Detalles de los rodillos que se emplean para desarrollar la sección del segmento de larguero.

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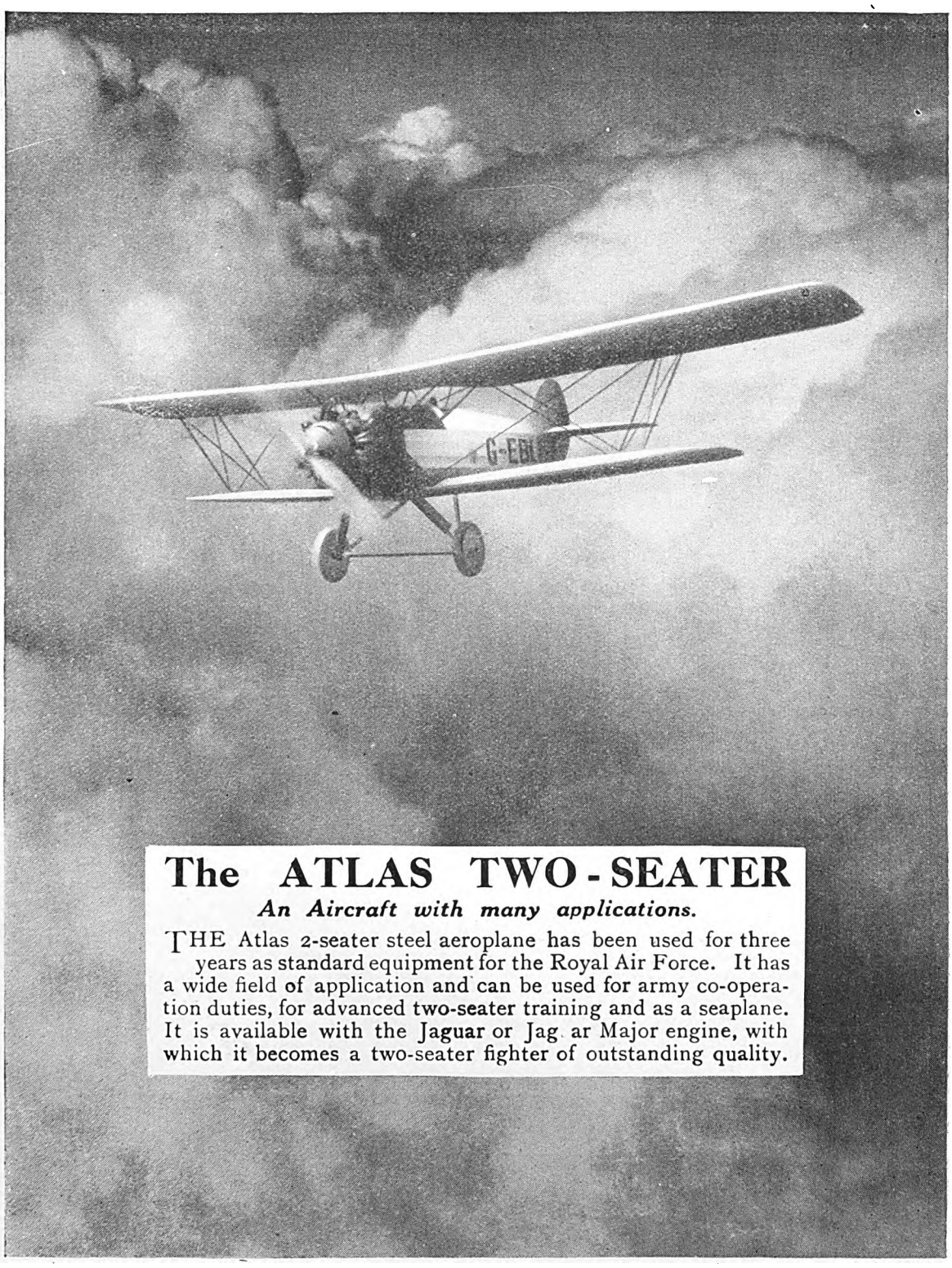

The ATLAS TWO-SEATER

An Aircraft with many applications.

THE Atlas 2-seater steel aeroplane has been used for three years as standard equipment for the Royal Air Force. It has a wide field of application and can be used for army co-operation duties, for advanced two-seater training and as a seaplane. It is available with the Jaguar or Jag ar Major engine, with which it becomes a two-seater fighter of outstanding quality.

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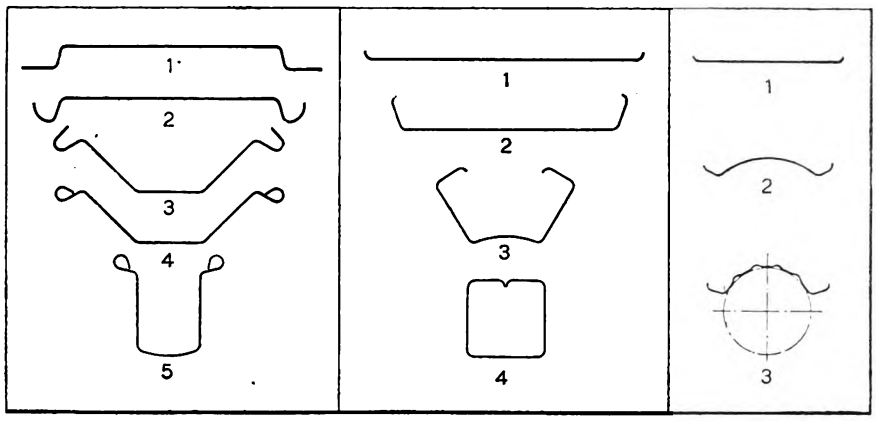


Drawings showing the development of steel sections for the rib boom, rib bracing and spar segment.

Croquis schématique montrant le développement des sections en acier pour l'armature des nervures, les croisillonnements de celles-ci et le segment de longeron.

Croquis mostrando el desarrollo de las secciones de acero para la armadura de los nervios, los refuerzos de éstos y el segmento de larguero.

the forward end of which is a screw-operated vice arrangement to grip the end of the strip being rolled.

This carriage has a swing hook, which is engaged or released from the chain by a lever on the carriage. The chain is driven by an electric motor and suitable gearing at a speed equal to a drawing speed of 16 feet per minute. The mechanism is controlled by a clutch which may be started or stopped at any point along the bench by a sliding rod.

There are two rolls in each housing and the upper roll may be adjusted in relation to the lower roll by a hand-screw in the top of the housing. The rolls are not driven in any way but are free to revolve when the strip passes between them.

To start the strip through the rolls each bottom roll is fitted with a spur gear. These may be coupled together by a long rack, and by turning one of the rolls by a ratchet lever all the rolls can be turned at a uniform speed so the strip can be fed forward until enough has been passed through to enable the drawing carriage to grip it. The rack is then removed and the rolls are free to revolve at their own speed as the strip passes through them.

A segment of the tubular spar-boom is produced by being passed through three sets of rollers. In the first stage the edges are turned up, the middle portion is bowed in the second stage, and the longitudinal flutes are rolled in at the third, or last, stage.

Assuming that all the components for the spars are completed and cut to the required length, the next stage is the assembly.

In this stage the use of jigs plays an important part.

The first procedure is to attach the two inner segments of the top and bottom booms to the web. Each pair of segments is assembled on a dummy tube to which is permanently attached a dummy of the third segment, or what is really the spar flange. The web member is then placed in position, and the whole is placed in jigs to ensure the correct alignment and distance of the two booms from centre-line.

Holes are then punched at intervals along the flanges of the segments and web, and after inserting rivets the assembly is passed to the next operation.

This consists of completely rivetting the lower segments to the web. And at this stage all tubular inserts are located in the booms at all points where external fittings are to be attached to the spar.

To complete the spar the third, or flange, segment is rivetted in place.

For this purpose the spar is placed between angle-iron supports on the top of a bench and the third segments are laid in place and clamped with a jig at one end.

The bulbous sections which grip the flanges of the upper segments of the booms are then pulled on by a travelling clamp. This clamp is pulled along the bench by a steel cable which passes over a windlass at one end of the bench.

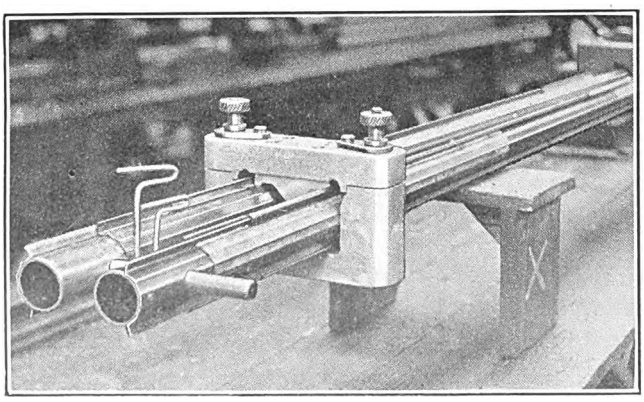
The back face of the travelling clamp is grooved to fit over the edge of the segment flanges and it has a grip which holds the end of the bulbous section and draws it over the gripped flanges.

Behind the clamp is drawn a slipper-plate which prevents the bulbous sections from opening out during their passage along the spar. And at regular intervals small "C" clamps are clipped to the spar to hold the assembly in place until it is rivetted together.

The rivetting is done by hand, in two operations. The first punches the holes at one-inch intervals, and the second, after the cup rivets have been inserted, closes the rivets.

For securing the internal inserts to the booms, and for attaching external fittings to the spars, after they have been assembled, Sir W. G. Armstrong Whitworth Aircraft Ltd. uses a rivet known as the "pop" rivet. This is a hollow rivet which can be expanded inside the spar entirely from the outside. The illustration on the next page shows in a series of sketches how the rivet is expanded.

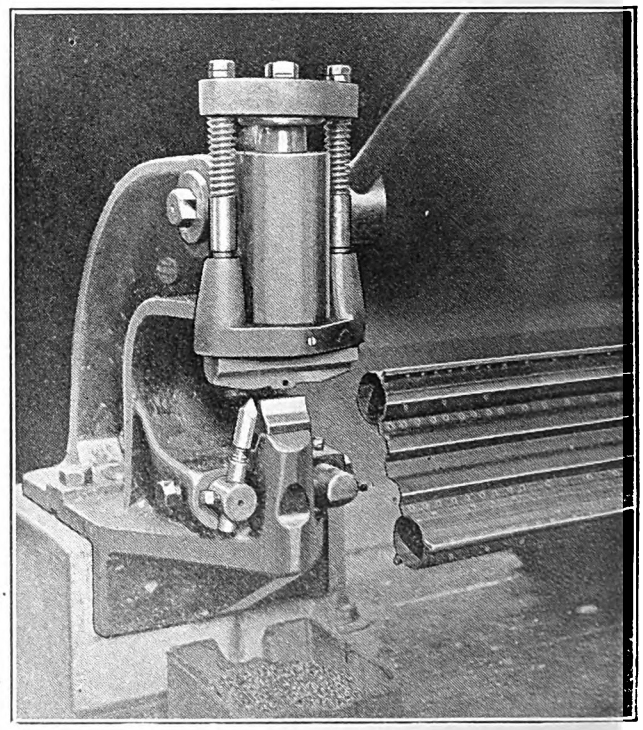
The rivet is threaded onto a pin, which has a cone-



The jig for locating spar booms ready for inserting the web.

L'outil destiné à la mise en place des armatures des longerons prêt à placer le flasque.

La herramienta para colocar las armaduras de los largueros dispuesta para insertar un brazo.



Hand-operated punch with spacing device for punching rivet holes in spars.

Foret utilisé à la main avec dispositif à forer les trous de rivets dans les longerons.

Perforador operado a mano con dispositivo para la perforación de agujeros de remaches en los largueros.

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SPEED 134·3 m.p.h.

Class C. First category Light Aircraft up to 400 Kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 23rd April, 1930, at Darmstadt; 214.848 Kms. (134.3 miles) per hour over 100 Kms. (62.5 miles).

HEIGHT 26,868 feet

Height Record by the Academical Flying Group, Darmstadt, on a 100-110 h.p. Genet Major engined D.18 aircraft, 8,142 metres (26,868 ft.).
Light aircraft, 3rd category (single-seaters weighing less than 350 Kgs), altitude (France), Albert monoplane, fitted with 80-88 h.p. Genet engine at Le Bourget, 11th February, 1930; 7,730 metres (25,509 ft.).
Class C. First category Light Aircraft up to 400 Kgs. 2-seater, Aircraft D.18 of the Darmstadt Flying Academy with 100-110 h.p. Armstrong Siddeley Genet Major engine, on the 21st April, 1930, at Darmstadt. Height 7,521 metres (24,819 ft.). Height Record for light water flying craft on 80-88 h.p. Genet engined Junkers Machine, single-seater 5,700 metres and 2-seater 4,700 metres (15,510 ft.).

ENDURANCE 1,553 miles

Light aeroplane, 3rd category, single-seaters, weight 200-350 Kgs (440-770 lbs), distance in a straight line, 17th July, 1929; D. S. Zimmerly, Barling, U.S.A., N.B.3 80-88 h.p. Genet, 2,500 Kms. (1,553 miles).

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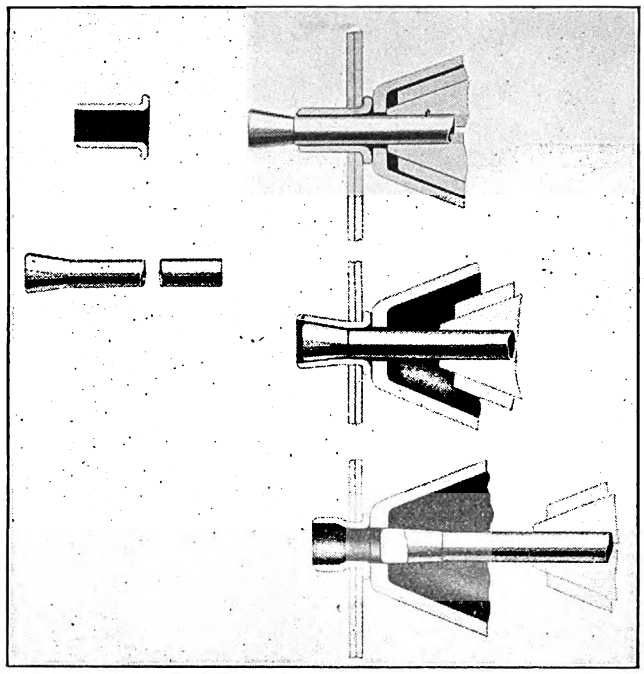


A diagram showing the method of closing "Pop" rivets.
Diagramme montrant la méthode de fermer les rivets "Pop."
Un diagrama que muestra el método de cerrar los remaches "Pop."

shaped head, and both are passed through the hole in the two or more thicknesses of metal which are to be rivetted. The shank end of the peg is gripped by an expanding tool and the peg is pulled through the rivet, the nose of the tool meanwhile holding the rivet rigidly in place.

The action of pulling the cone-end of the peg through the rivet is first to bell it out on the inside and secondly to expand the portion in the hole so that the members are held together securely.

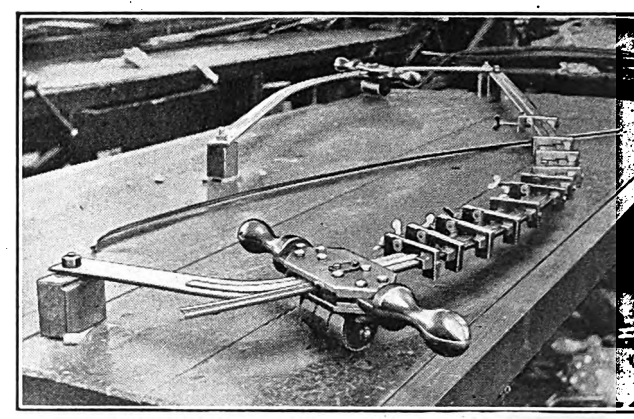
When the cone-end of the peg meets with resistance, at the point where the rivet enters the hole, it is wire-drawn down to a smaller diameter and is finally drawn through to the outside.

The expanding tool may be of either the hand or foot operated type. The hand type operates on the lazy-tongs principle and requires surprisingly little energy to operate it.

The drilling of holes in the spars for the attachment of fittings is done in jigs of a length to suit the spars. These jigs consist of steel channels supported at each end and in the middle by circular flanges, which rest on flanged rollers secured to the top of the bench. Locating cradles, in which are mounted the jig bushes, are fitted on the spar and the necessary holes are drilled in the spar.

All holes are bored through from each side, as the firm found that when they were bored straight through from one side the holes were apt to "run."

These holes are bored through both the boom and the tubular inserts, and often at an angle, but with the rolling jig system used the whole procedure is very reliable and very simple.



The bending equipment for rib booms.
L'équipement à cintrer les armatures des nervures.
El equipo para curvar las armaduras de nervios.

WING RIB CONSTRUCTION.

The ribs of the Atlas are built up of top and bottom booms of a drawn trough section with beaded edges and are interconnected with diagonals drawn to a square box section. The whole is held together with tubular rivets.

The boom and diagonal sections are of steel strip drawn from the flat through rolls in a manner similar to that described for the spar sections, but in the case of the rib sections there is no subsequent heat treatment.

The rolled sections are turned out in 20-foot lengths and these are cut to the required lengths by an electrically-driven cutting machine which uses a toothless steel disc running at a speed of from 4,000 to 5,000 r.p.m.

The motor spindle which carries the cutting disc has at its end a grinding wheel, which is used for grinding a small radius on the ends of the diagonal members. The ends of the bracing pieces are first drilled for the rivet holes, and these holes are then used as the pivot points for the radius grinding action.

The rivet holes are all jig-drilled and the jigs used are adjustable to allow the drilling of diagonal members of different lengths.

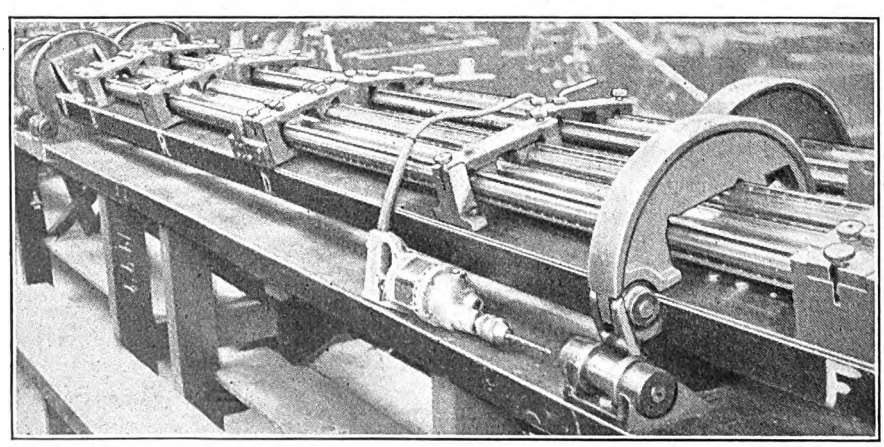
The rib booms are bent to shape on formers. For the ordinary booms the former consists of a steel bar which is mounted horizontally a few inches above the surface of a wood bench. The two bending rollers, together with a third roller, whose function is to keep the bending rollers close up to the front edge of the former bar, are mounted on a carriage, which is supported on the bench by a further broad roller. The two bending rollers are shaped to suit the outside of the boom section and the former to suit the inside.

The carriage is pulled along the bench by two handles. And specially shaped "C" clamps, which hold the boom section in position, are transferred from the front to the rear of the carriage as it advances.

For compression-rib booms the former is made of hard-wood faced with a steel strip. This former instead of lying horizontally stands up from the bench and the bending rollers are held in position by a third roller which is under the former and holds the carriage down.

Besides bending the section, the effect of the rollers is to iron out any creases or wrinkles caused by the bending.

After bending the booms are drilled, and here again the material is clamped to a steel former-bar and the numerous



The jig used for drilling holes through the spar from each side.

Le même outil employé pour forer des trous à travers le longeron de tous les deux cotes.

La misma herramienta empleada para perforar agujeros a través del larguero por ambos lados.

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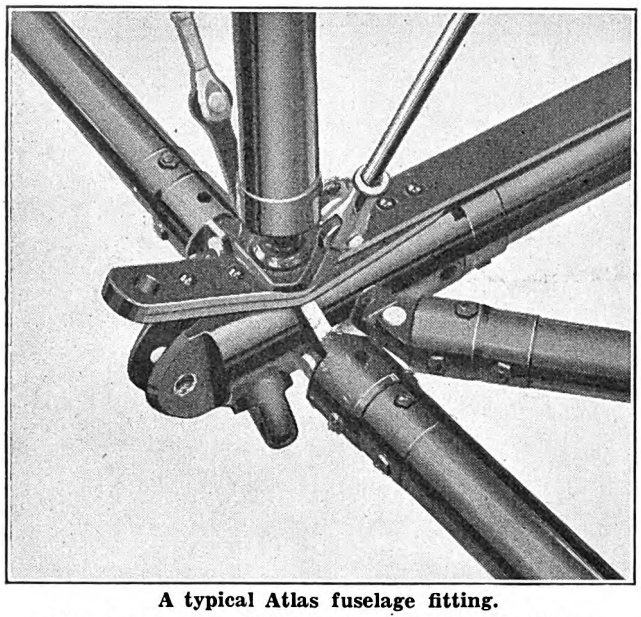


A typical Atlas fuselage fitting.
Un ferrure caractéristique du fusélage de l'Atlas.
Una herraje característico de fuselaje del Atlas.

The tubes are of 45 to 50 tons high-tensile steel to Air Ministry T5 specification and the joints are machined from solid high-tensile steel bar to Air Ministry S2 specification.

The vertical struts have a ball-ended fitting at each end and these seat in cups formed in the longeron fittings. The top and bottom longerons are held firmly in position with the vertical struts by transverse wire bracing. The cross struts are attached to forged fittings, which also carry the transverse wire bracing.

This system of construction lends itself to rapid assembly by jig and the assembly may be made by semi-skilled labour.

Interchangeability of parts is another important feature, and with this system of construction an efficient repair may be made without complete replacement.

As an example, should a tube be buckled it may be sawn through in the middle of the buckle, the tube restored to shape and internal and external sleeves fitted and bolted together. This type of repair has been approved by the Air Ministry and has been done in Service.

TESTING OF COMPONENTS.

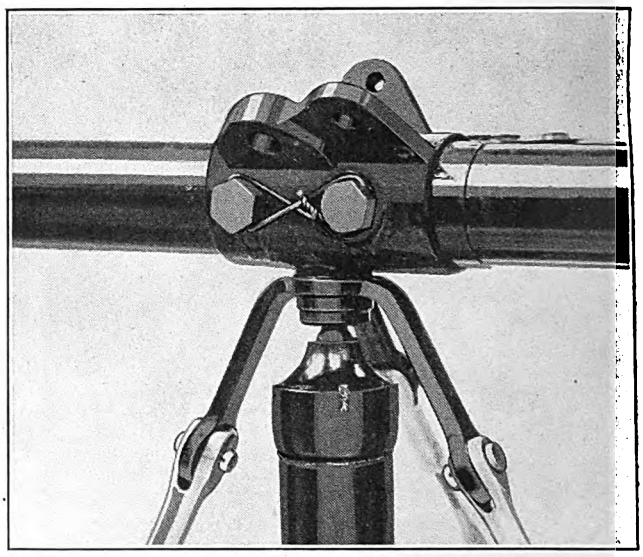
After final assembly the wing components are submitted to very elaborate and exacting tests. In fact, every part of the aeroplane that is subject to stress passes through some form of test to ensure its ability to carry the specified load.

For instance, the proof-loading test of a bottom wing-spar in the Atlas consists of supporting each end of the 15-foot spar and suspending a load of 500 lbs. at its middle. Under this load there is a deflection of 6 inches at the middle of the spar, but the spar returns to normal straightness when the load is removed.

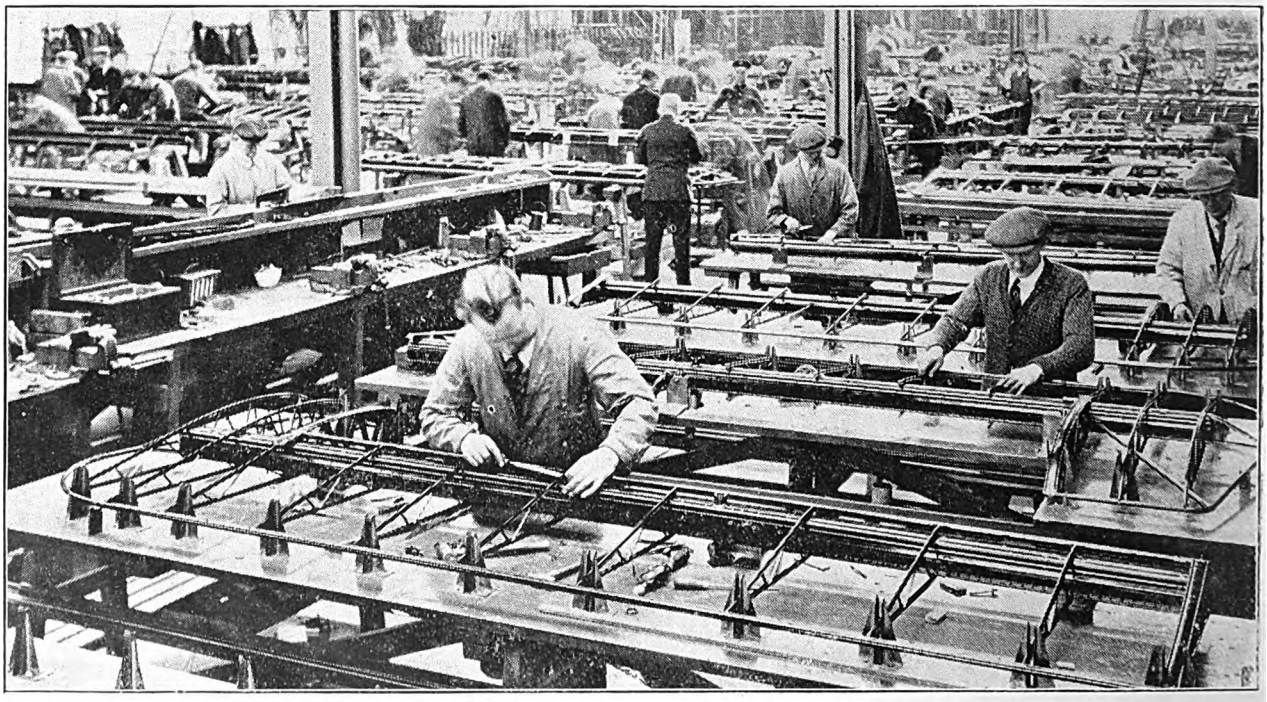
The depth of the bottom spar is 3¾ ins. and the weight is 0.71 lbs. per foot. In the above test it is subjected to an outside fibre stress of 55 tons per square inch, which corresponds to a moment of resistance of 10.4 ton-inches. The maximum moment of resistance developed by the spar is 12.9 ton-inches.

Other tests are made to determine the maximum compression and transverse loadings of the spar.

For testing ribs Sir W. G. Armstrong Whitworth Aircraft Ltd. have designed an apparatus to conform to the requirements of the Air Ministry as laid down by the Royal Aircraft Establishment. In testing a structure like a rib the



A ball-ended fuselage joint.
Un joint à extrêmité sphérique pour le fuselage.
Una junta de cabeza esférica de fuselaje.



Assembling ailerons for the Atlas biplane.
Montage des ailerons pour le biplan Atlas.
Montaje de los alerones para el biplano Atlas.

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THE LANDING EQUIPMENT

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(654)

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ideal to be aimed at is to reproduce as closely as possible the stresses induced in any particular portion of the rib when in service.

In a rib these stresses vary according to the different conditions of flight, and therefore at least two tests have to be made representing the two extreme conditions under which the part may be working. These two conditions are: (1) Slow flight, when the machine is almost at the stall, in which case the C.P. of the rib is forward, and (2) maximum speed, when the C.P. is further back.

With the testing machine used by Sir W. G. Armstrong Whitworth Aircraft Ltd. the load is applied at sixteen points closely spaced about the region of high pressure, and the loads applied at each point are such as to give the required centre of pressure.

FINAL ASSEMBLY OF WINGS.

The final assembly of the ribs to the spars is comparatively straightforward, and is considerably simplified by the special rib attachments used in the Atlas wing.

These consist of two tubular members hinged at the middle, and rivetted to the rib-booms at their outer ends. To these tubes are rivetted pressed-steel sheaths and in these small steel filets are located which project outward and rest behind the top flanges of the spar boom.

The two tubular members before assembly incline inwards towards their centre, but after the rib is jigged into place along the spars they are straightened up by tightening up a cycle-spoke nipple. This brings them into a vertical position and forces the steel filets to grip the spar-booms.

The system is shown in the sketch on page 1214.

After the wing tail unit and fuselage frameworks are completely assembled they are sweated for 1½ hours in an oven and are then lowered complete into a deep tank filled with enamel.

Subsequently they are allowed to drain for one hour, are stoved for 3½ hours, following which they are again dipped for a second time and re-stoved for a further period of 3½ hours.

The coating produced by these methods is hard enough to offer great resistance to abrasion and scratching. At the same time its elasticity is so high that the film of enamel will remain unbroken after considerable bending or distortion.

AN ACKNOWLEDGMENT.

The majority of the photographs and drawings from which the blocks, used to illustrate this article, were made have been kindly lent by *Machinery*, the well-known weekly engineering journal, to whom acknowledgment is due.

THE HEAT TREATMENT OF AIRCRAFT STEELS.

During recent years the heat treatment of steel for general engineering use has been developed to a very high degree. This is particularly noticeable in the automobile and aero-engine industries, but the heat treatment of steel for aircraft construction has presented quite a different problem. The structural parts of an all-steel aeroplane which require heat treatment, such as the wing spars, are extremely delicate and unwieldy components. A section of a steel spar, perhaps twenty feet long and only one-hundredth of an inch thick, cannot be dealt with in the same way as a small and rigid forging or stamping.

Until about three years ago the practice was, for such parts as were made from the steel strip, to be made from high tensile steel which had been hardened and tempered in the flat state,—either by being drawn through a furnace or by rolling each length up and treating the whole as a coil. This method suffered from the obvious disadvantage of necessitating rolling the section in an already hardened state.

The only practical means of producing steel spars of hardened steel strip is by applying heat treatment after the various sections have been drawn. For this procedure Sir W. G. Armstrong Whitworth Aircraft Ltd. have developed a process wherein the heat is not supplied from a surrounding furnace but by the resistance of the strip itself to the passage of an electric current.

The process used consists of hardening and then tempering the sectioned strip. And for hardening the strip is suspended vertically to prevent distortion.

The equipment comprises a steel plate muffle which is lined with fire-brick material. This extends upwards for 24 feet and has a cross-section of about one square foot inside. The object of the muffle is to retain the heat and protect the strip from atmospheric influences as in ordinary heat treatment practice.

At the lower end of the muffle is a door which gives access to the interior, and below the muffle is attached a steel-plate box which forms the quenching chamber.

This chamber is closed at the bottom by hinged plates which can be swung aside to leave the opening clear. The plates between them accommodate a pair of dies similar to those used in the strip-drawing operations, and by fitting dies that correspond to the section of the strip to be hardened, the opening can be completely sealed except for a narrow slit to pass the strip.

The strip to be hardened is suspended in the muffle between two pairs of grips.

The top grip is suspended on a copper cable which passes out of the top of the muffle, over a pulley, down outside the muffle through a pulley, from which a heavy jockey weight is suspended, and then up again to a fixed connection leading to a transformer.

A separate cable is fixed to the jockey weight and leads thence to a ratchet winding-gear. This raises or lowers the weight and accordingly the grip holding the strip inside the muffle. The weight also serves to take up the extension of the strip caused by the heat and to keep it taut.

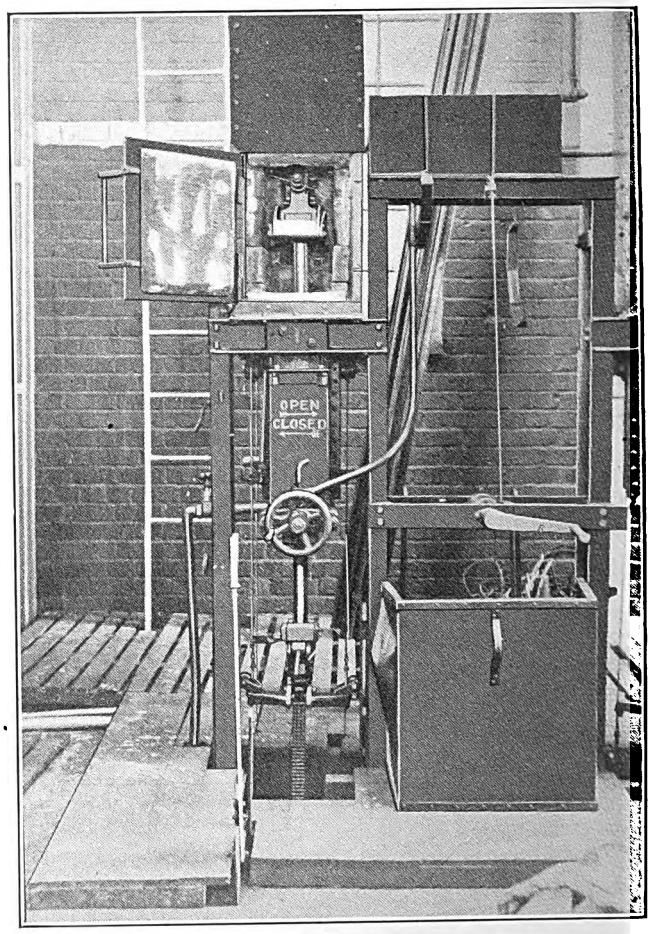
The grip for the bottom end of the strip is attached to a form of endless belt, one half of the belt consisting of a chain and other half of flexible steel cables.

The chain connects the grip to a sprocket wheel located at the bottom of a 26-foot deep pit sunk in the ground. The sprocket is driven by a small 5 h.p. motor through a reduction gear with an intervening clutch and a brake. Attached to the rear side of the endless belt is a weight which overbalances the grip so that when the clutch is released the grip automatically comes up to the top.

The sequence of operations in heat-treating a strip is as follows:—

The dies in the bottom of the quenching chamber are opened and a strip of rolled steel is pushed up through the chamber and clamped in the top grip. The ratchet winding-gear is then operated to allow the external jockey weight to draw the strip up into the muffle until about one foot of the strip is left below the dies.

The bottom grip is then attached to the strip which is then raised until the lower grip touches the dies. The



The Heat Treatment equipment for hardening steel strip showing the bottom of the muffle, the quenching chamber and the top of the pit.

L'installation du Procédé de Réchauffement pour le trempage des bandes d'acier montrant le fond du moufle, la chambre d'amortissement et la partie supérieure du puits.

La instalación del Procedimiento al Calor para el templado de las bandas de acero mostrando la cámara de amortiguación y la parte superior del pozo.

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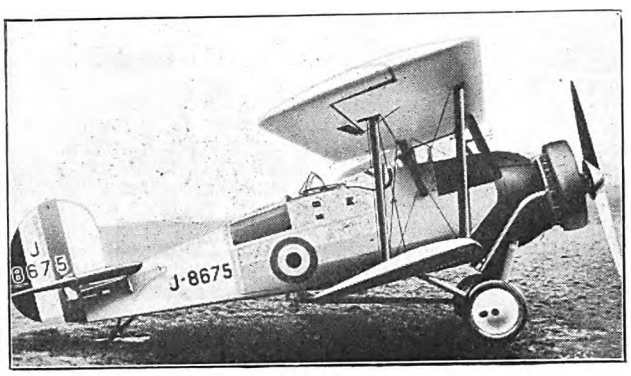

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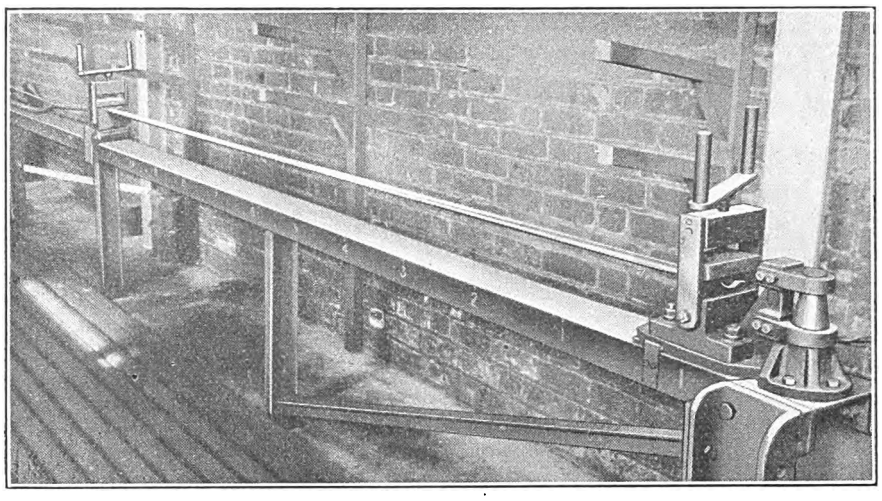

Equipment for electrically tempering spar strip.

Outillage pour faire tremper à l'électricité les bandes des longerons.

Instalación para templar eléctricamente las bandas de los largueros.

dies are then tightened up to form a good contact on the strip, but not sufficiently to prevent the strip being pulled through them. The strip is now ready for treatment.

The alternating current on the main is 2,800 volts and the transformer permits the use of any voltage up to 200.

The resistance of the steel when cold is low and if the full voltage required were switched on at once a very high current would pass for a second or two until the strip had heated up and the resistance had increased.

A low current is, therefore, switched on at first and is rapidly increased as the strip heats up until the required current is passing and the strip attains a uniform temperature. About 1.2 kilowatts per foot length and per inch width are necessary, and about 15 seconds are required to reach the full temperature of 820-850 deg. C. from cold.

The current is left on for half a minute, and is then decreased until the temperature falls to about 700 deg. C.

At this point the quenching chamber is flooded with about 9 inches of water, oil or, in most cases, quenching suds and almost immediately the clutch is let in and the strip drawn down through the dies, which remove the scale, and down into the pit below.

As the top grip reaches the top of the quenching chamber it is automatically opened and the released strip is drawn right out.

The bottom grip is allowed to come up again by bringing into action the overbalance and the strip is released and removed.

The steel, which previously had a tensile strength of 40 to 45 tons per square inch is now hardened to about 110 tons per square inch, but it has no ductility and requires tempering.

The tempering is done in a manner similar to the hardening, except that the strip is held in a horizontal instead of a vertical position.

The tempering bench has at one end a fixed clamp which holds the strip under treatment. The clamp at the other end is on wheels, and is free to move to any required position on the bench. It is also connected by a chain to a lever at the far end of the bench by which tension may be applied to the strip during treatment.

The strip is stretched between the two clamps and the necessary current passed through it to raise it to a temperature of 420 degrees C.

During this period the steel is somewhat plastic and by application of suitable tension by the end lever, any curvature in the strip caused by the hardening process is completely removed. The temperature in this case is maintained for 90 seconds, at the end of which time the strip is allowed to cool in air, and is then removed.

Its tensile strength is now about 90 tons per square inch and its ductility has been greatly increased.

The final operation, before passing to shops for assembly into spars, is the testing of the strip by a diamond hardness-testing machine.

The watts used during hardening and tempering processes are registered on a chart during these operations and these charts, which show that the correct temperature was used, together with this hardness test and occasional tensile tests give ample security against incorrect treatment.

HOW ARMSTRONG WHITWORTH AIRCRAFT ARE TESTED.

The testing of aircraft whether of new or standard design is a task that demands the greatest care and a very high degree of accuracy.

The tests imposed on a new design of aircraft are naturally more prolonged and more complete than those made on an aircraft already in production, and it is the former, which is the more interesting, that is dealt with here.

The machine, which has already been carefully inspected at every stage of its manufacture, is first subjected to a final inspection. This may take several days and is made both by the company's and also by the official inspectors.

It is then transferred from the erecting shop to the running shed, where it is weighed and the position of the centre of gravity determined. Both the weight and the centre of gravity should correspond closely with the figures estimated by the Drawing Office, but as the equipment has to be allowed for it may be necessary to add ballast at the correct distance from the centre of gravity.

The installation is then very carefully gone over and the engine finally tuned up. In particular the flow of fuel from the tanks to the carburettor is measured to ensure that this corresponds with the amount laid down. The flow is also tested at extreme angles on the machine, and this is an important point in view of the fact that the feed is generally by gravity.

The engine is then run up and provided that everything is correct the machine is taken out on the aerodrome for its first trials at light load. The pilot begins by taxying and noting the machine's response to the controls and its general behaviour on the ground.

After assuring himself that all is in order he then makes a few short straight flights, the object of which is to enable him to land quickly and safely should any fault in the controls due to an error in trimming or for any other cause suddenly make itself felt. Generally, however, both the taxying and straight flights go off satisfactorily and the pilot then takes off and flies round in a normal way.

During these light load tests he notes how the machine handles in the air and how the engine performs and thus obtains his first impressions of the main characteristics of the new aircraft. The machine is then very carefully inspected and any suggestions made by the pilot regarding its control or general behaviour are noted. Assuming everything to be satisfactory, handling tests are then made and the machine is put through a brief series of manœuvres and aerobatics which represent the requirements for this particular type.

For the next series of tests the machine has to be weighted up to full load. So far as is possible all the equipment laid down for this particular type of aircraft is fitted and extra weight is added to make up for parts that are not available. The machine again goes through a complete set of tests in the air and again its performance and feel are noted. The handling tests at full load are elaborated and include everything that the machine is likely to be called upon to do in service. For example there are the diving and spinning tests and the machine is spun at least eight times in either direction and is dived to its greatest terminal velocity.

After the tests at light load and full load have been completed it is next necessary to put the machine through its performance tests with full load. These flights include climbs against a stop watch to the machine's service ceiling and maximum speed tests at various altitudes.

In order to reduce all tests to a universal standard for purposes of comparison, readings for the ground temperature and barometer are taken and the actual figures obtained during the tests are then converted by means of a standard atmosphere chart. Mean curves are drawn through all the points obtained and the speed, r.p.m., rate of climb and time to height, are then taken off the curves.

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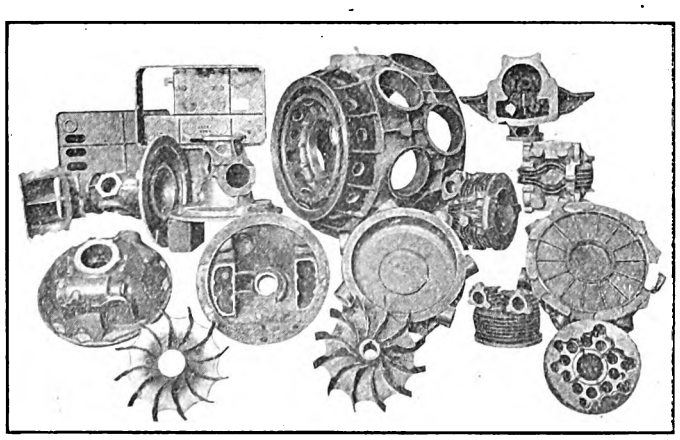

A SET OF CASTINGS IN "HIDUMINIUM" R.R.50 ALLOY.

THE OPINION OF AN AUTHORITY.

BELOW IS AN EXTRACT FROM A PAPER ON WATER-COOLED AERO ENGINES, READ BY

MR. A. J. ROWLEDGE,
M.I.A.E., F.R.Ae.S., A.M.I.Mech.E.
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BEFORE THE ROYAL AERONAUTICAL SOCIETY

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In addition the air speed indicator has to be calibrated and the position error determined. The latter requirement is necessary owing to the angle of the pitot head on the strut and the interference of the wing. Generally the correction for the position error is a positive quantity on a slow machine and a negative one on a fast one. This error is determined by timing the machine over a known distance and noting the difference between the recorded and actual speeds.

An altimeter with very open scale is used on the performance tests as the ordinary type is not considered accurate enough. This instrument is supplemented by a split-seconds stop watch with two hands, one of which can be stopped and then restarted to synchronise with the other so that a stationary reading can be taken at any time during the tests. The stop watch may be slung on a string round the pilot's neck, while his aircraft performance test card is mounted on a board over one knee and the special altimeter on the other.

In addition to this he has to watch a large thermometer mounted on one of the struts, his engine revolution counter, the position of his altitude control lever, the oil pressure and the boost and to note as many of these readings as possible in the course of his climb to the service ceiling.

Thus there may be as many as 70 entries to read and to make in a period of 18 minutes, from which it will be gathered that the pilot's time is fully occupied.

To ensure the best possible climb to the service ceiling a series of partial climbs have already been made so that by the time the pilot has to do the principal test, which should be made in a straight line, he knows by previous experience the best climbing speeds at various altitudes. His performance test card, therefore, has these set speeds marked down against various altitudes and when he sets off on his height test he endeavours to conform to these figures as closely as possible.

The pilot starts his watch as he leaves the ground and tries to take up the speed fixed for the first 1,000 feet and hold it. As soon as the aneroid reads 1,000 feet he stops one hand of the watch, reads the temperature on the strut thermometer and logs this, the time and as many other readings as he conveniently can on the test card on his knee. He restarts the stopped hand of the watch and prepares to repeat the process as soon as the altimeter registers 2,000 feet, repeating this routine at the necessary intervals until the service ceiling is reached.

Above the height of 15,000 feet the pilot is further encumbered by oxygen apparatus, which is fed to him from a cylinder communicating by a pipe line to a mask over his face. For extreme heights electrically-warmed clothing may be used, as Armstrong Whitworth aircraft have been tested to a height of about 30,000 feet where a temperature of minus 50 degrees C., which is equivalent to 100 degrees F. of frost, was reached.

As at these extreme altitudes the ordinary thick grease on the control hinges freezes solid, thin oil has to be used to prevent the controls and tail adjustment becoming inoperative. In cases like this one has to guard against frost-bite, for which reason the controls are not grasped but merely steadied with a flat hand. Naturally, too, making notes under these conditions is no simple task.

On the descent speed tests at various altitudes may be made and here the pilot's principal difficulty is to maintain the machine in an exactly level position. Only by holding the stick steady and watching the instruments can a pilot hope to make an accurate test. Further it is necessary to make a run of at least 10 miles in order to allow the machine to reach and settle down to its maximum speed.

A great deal of patience and practice are necessary to ensure these tests being accurate.

As may be imagined it is essential to have good visibility and calm air for these tests and the lack of these is the reason why tests sometimes take a week or two to complete. For climbing a modern machine to its ceiling a clear sky is necessary because at these great altitudes the pilot's senses are slowed down and the work in hand demands the fullest concentration without worry from the need for observing the position on the map.

To make matters worse winds of great velocity are often encountered at such high altitudes and at the end of his tests the pilot may easily find himself many miles away from his home aerodrome with an insufficiency of fuel.

Finally the machine is flown for a period equivalent to its normal endurance based on the fuel capacity and the cruising speed as laid down in the specification.

ARMSTRONG SIDDELEY AIR-COOLED AERO ENGINES.

Armstrong-Siddeley Motors, Ltd., was formed as such in 1920. This company represented a combination of the interests of the Siddeley-Deasy Motor Co., Ltd., with those of Sir W. G. Armstrong Whitworth and Co., Ltd.

During the War, 1914-18, the Siddeley-Deasy Company was entrusted with the development of the B.H.P. water-cooled engine on a production basis and in the course of this development the company evolved a design of aluminium cylinder-block which proved very successful. The result of this development work was the famous Siddeley Puma, which engine was produced in huge quantities during the last year of the War.

Also during the last year of the War the company began the development of the air-cooled radial engine. The first of this type was a range of three engines with two, seven and fourteen cylinders, developing 45, 150 and 300 h.p. respectively. The principal feature of these three engines was the interchangeability of parts, including the cylinders. This desirable feature has been retained up to the present day.

These three engines were known as the Ounce, Lynx and Jaguar, and to-day the two last-named are, as the result of over ten years of development, two of the most reliable aero engines in the world.

The present series of engines covers a full range of powers from 80 to 800 h.p. These include the 80 h.p. Genet, the 100 h.p. Genet-Major, the 150 h.p. Mongoose, the 215 h.p. Lynx, the 250 h.p. Lynx-Major, the 400-440 h.p. Jaguar, the 500-525 h.p. Jaguar-Major and the 700-800 h.p. Leopard.

The general construction of all these engines is similar, and their design embodies a number of important features enumerated below, which are common to all engines.

The use of a steel cylinder-barrel (known in the works as a "liner") on to which an aluminium cylinder-head is screwed and shrunk by a special patented process, which ensures a gas-tight joint.

The special method adopted for screwing the cylinder-barrels into adaptors in the crankcase gives a very secure and easily accessible attachment.

The elimination of studs leaves the strength of the crankcase unimpaired and also makes the stripping of the engine easy and economical, owing to the fact that each cylinder is located by a locking screw. Also, the radial arrangement of the cylinders obviously allows any one of them to be removed without interfering with the others.

A further point of interest is the fact that the cylinders, pistons, gudgeon-pins, valves, valve-springs, rocker-gear, push-rods, tappets, master-rods and auxiliary-rods, air-screw boss and bearer-plate of the Mongoose, Lynx and Jaguar, five, seven and fourteen-cylinder engines are interchangeable.

In the Lynx and Jaguar engines the range of common parts also includes the timing gear, front nose-piece, master-rod and oil-pump.

The result of all this interchangeability is that where engines of these three types are used in one service or by one company for different tasks the maintenance of these three types of engines is greatly simplified. And for the same reason the stock of spares to be carried may be reduced to a minimum.

Certain of the engines of the Armstrong-Siddeley series may again be sub-divided into two or more versions of the respective types by gearing and/or supercharging.

The Jaguar is produced in four types, that is, the plain or direct-drive type, the geared type, the geared and supercharged type, and the direct-drive supercharged type.

The Jaguar-Major is a geared engine, and may be supplied with or without supercharger.

The Lynx is produced in three versions—either plain, geared or supercharged.

The Genet-Major is produced in either the plain or geared type.

Armstrong Siddeley engines are produced on a large scale in a modern factory, which is equipped with the finest tools that can be provided.

The factory is laid out on a system that ensures the minimum waste of time and the most efficient use of material and labour. Every part is subjected to the most rigorous tests and careful scrutiny before, during and after manufacture. Every engine and every engine development has to go through and satisfy the Armstrong Siddeley system of tests in addition to the usual Air Ministry type-tests, which ensures that the finished product will give the highest degree of reliability in service.

Overleaf follow brief descriptions of the engines which form the Armstrong Siddeley range.

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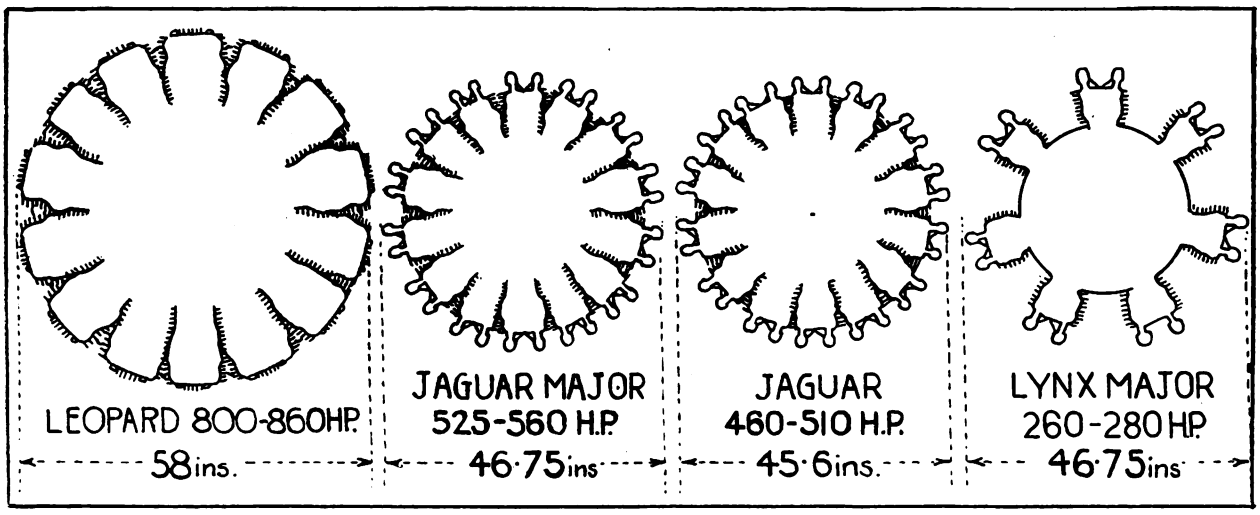


Half the range of Armstrong Siddeley air-cooled radial aero-engines.
Moitié de la collection des moteurs d'aviation Armstrong Siddeley en étoile et à refroidissement à l'air.
Mitad de la colección de motores aéreos Armstrong Siddeley en estrella y enfriamiento por aire.

THE ARMSTRONG SIDDELEY LEOPARD.

The 700-800 h.p. Leopard engine has been designed and developed for use in torpedo-carrying, heavy bombing and load-carrying aircraft, and it is believed to be the most powerful radial air-cooled engine in the World.

It has fourteen cylinders of 6 ins. x 7.5 ins. bore and stroke arranged in two rows of seven cylinders each. The steel cylinder-barrels are machined from forgings and have aluminium-alloy heads, which are screwed and shrunk on to the barrels, to which they are locked by a screwed locking ring which gives a metal-to-metal joint. The barrels are held in the crankcase by wedge-section clamping rings.

There are four valves, two inlet and two exhaust, per cylinder and these are operated by push-rods and rockers from a cam-ring, which is concentric with the crankshaft. This cam-ring runs at one-sixth crankshaft speed and has three inlet and three exhaust lobes. A compensating device to maintain constant tappet-clearance over the working range of cylinder-temperatures is embodied in the rocker-spindle supports.

The pistons are "Y" alloy forgings, machined all over, and each has three rings, two compression and one a scraper, all above the gudgeon-pin.

The crankshaft is in one piece and has two throws set 180 degrees apart. It is hollow and is carried in two large roller bearings which are located as close together as possible.

The connecting-rod assembly comprises two master-rods, each of which carries six auxiliary rods.

The crank-case drum, which carries both banks of cylinders, is a single alloy casting.

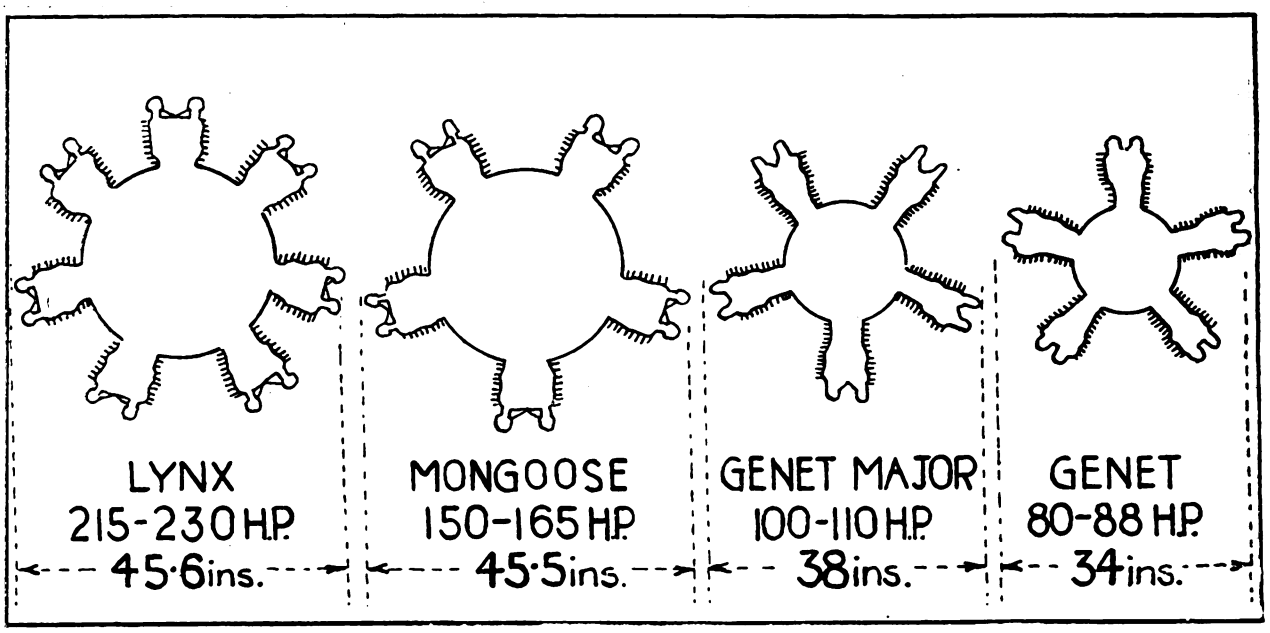
The front and rear covers, besides carrying the front and rear crank-shaft bearings, also carry the drives for the various auxiliary mechanisms.

A rear driving-shaft directly coupled to the crank-shaft operates the two 14-cylinder magnetos, gas-starter distributors, tachometer and petrol pump.

The oil-pumps are mounted on the front of the engine. The pressure-pump delivers oil through a relief-valve and filter to the centre of the crank-shaft and thence to the connecting-rods and bearings. At the bottom of the crank-case are an oil-sump and a filter, into which the oil drains from the engine. Oil is drawn from the sump by a scavenge-pump, situated under the pressure-pump, and is then delivered to the oil-tank, which is carried on the aircraft itself. On its way to the tank the oil passes through the jacketting of the carburetter and induction-elbow, thus heating the induction system and cooling the oil.

One Claudel Hobson carburetter supplies a mixture to the middle of the induction-chamber in the rear cover of the crank-case. This chamber encloses a centrifugal fan geared up from the crank-shaft, which delivers the gas to seven tangential induction-pipes, each of which is forked to supply one cylinder in each bank.

The two fourteen-cylinder magnetos each fire one plug per cylinder.



The other half of the range of Armstrong Siddeley air-cooled radial engines.
L'autre moitié de la collection des moteurs Armstrong Siddeley en étoile et à refroidissement à l'air.
La otra mitad de la colección de motores Armstrong Siddeley en estrella y enfriamiento por aire.

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Screwing and shrinking Jaguar cylinder barrels into the cylinder heads.
Travaux de vissage et embatage des corps des cylindres Jaguar dans les têtes des cylindres.
Operación de atornillar y embutir los cuerpos de cilindros Jaguar en las culatas de cilindros.

enclosed rocker-arms, roller-end tappets and a cam-ring driven by reduction gears at one-sixth engine speed.

The pistons are of forged "Y" alloy and carry three rings, two compression-rings above and one scraper-ring below the gudgeon-pin.

The single-piece crank-shaft is in the Jaguar a two-throw, and in the Lynx a single-throw, shaft.

The connecting-rods comprise a master rod of channel-section steel and six auxiliary circular-section hollow rods. The big-end is a separate unit consisting of a split steel bearing-shell, which carries end-flanges in which the wrist-pins for the auxiliary-rods are supported.

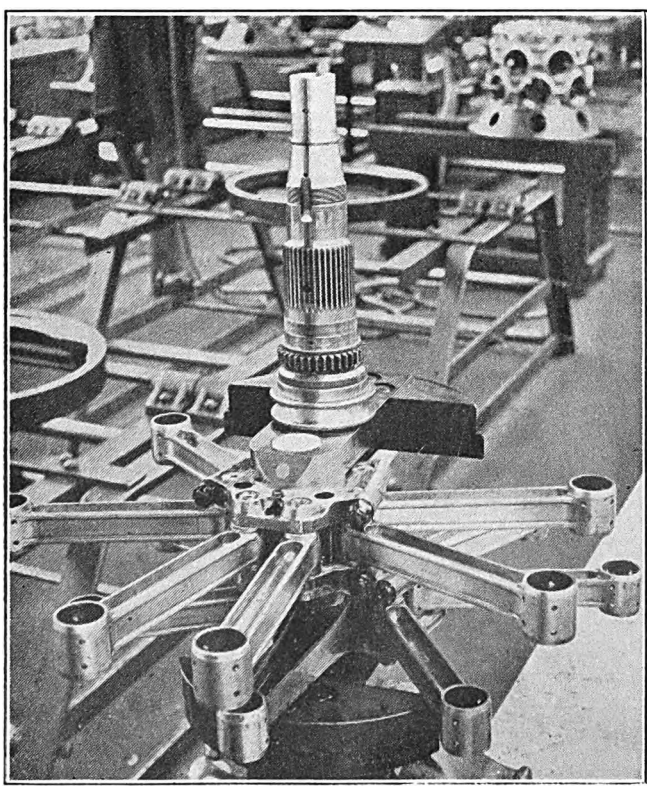
The crank-case is an aluminium casting. The front cover carries the crank-shaft journal and thrust bearings, and auxiliary drives for the cams, gas starter and oil pumps. The rear unit carries the rear bearing for the crank-shaft and the bearing for the induction-fan. This in turn has a cover which houses the magneto-drive gears and carries the supports for the magneto and other auxiliaries.

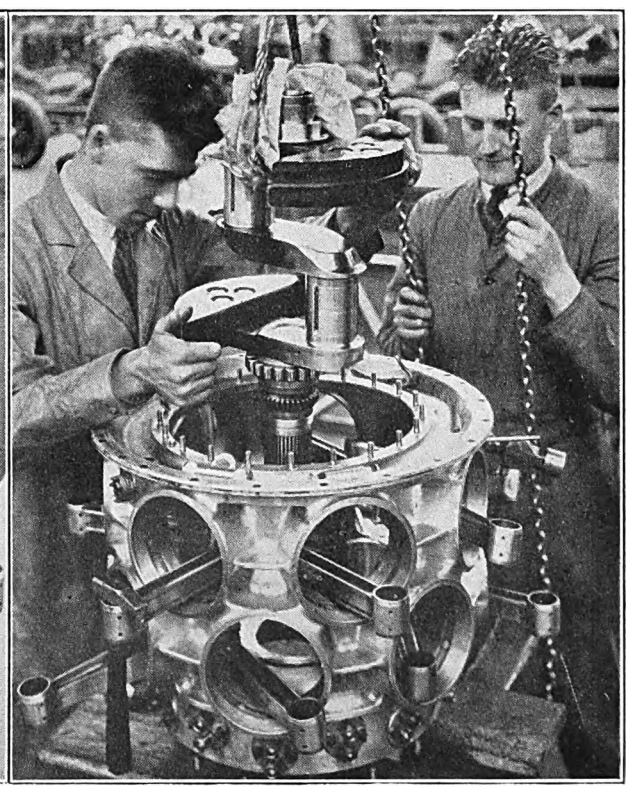
The lubrication is of the dry-sump type. The pressure pump draws its supply from the tank and forces it through a filter to the hollow crank-shaft and crank-pins. The oil which escapes from the crank-pins lubricates the cylinder-walls, pistons, etc., by splash, and drains back into the sump, whence it is returned to the tank by the scavange-pump.

A dual carburetter is attached directly to the rear crank-case cover, and supplies gas to an annular chamber therein. In this chamber is a centrifugal fan which distributes the mixture through tangential inlet-pipes to the inlet-valves. The fan-chamber is surrounded by an oil passage through which warm oil from the scavange-pump passes on its way to the tank. Warm oil also passes through a heater-jacket on the carburetter.

Both the Lynx and Jaguar may be fitted with a 3 to 2 epicyclic reduction gear and/or a supercharger.

These two engines are the best known in the Armstrong Siddeley range and they are being used in increasing numbers for military and civil purposes all over the World. Both are standard engines in the Royal Air Force and the Royal Canadian Air Force.





The assembly of the crank-shaft and connecting rods of the Jaguar engine.

Le montage du vilebrequin et des bielles du moteur Jaguar.

El montaje del cigüeñal y de las bielas de conexión del motor Jaguar.

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THE reliability, ease of maintenance, and high degree of interchangeability of the Armstrong Siddeley range of aircooled engines account for their success all over the world.

TYPES.

The 800 h.p. geared Leopard.

The 525 h.p. geared Jaguar Major with geared fan or supercharger.

The 460 h.p. or 400 h.p. Jaguar with or without gearing, with supercharger or gearing and supercharger.

The 215-230 h.p. Lynx.

The 150-165 h.p. Mongoose.

The 100-110 h.p. Genet Major.

The 80-88 h.p. Genet.

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Atlas, 2-seater steel aircraft for army co-operation, long-distance reconnaissance, high-speed bombing or advanced training, fitted with wheels, skis or floats. Fitted with plain, geared or geared and supercharged Jaguar or geared Jaguar Major with geared fan or supercharger.

A.W.XIV., single-seater steel fighter fitted with geared or supercharged and geared Jaguar or geared Jaguar Major with geared fan or supercharger.

Siskin, single-seater steel fighter for day or night flying or training, fitted with plain, supercharged, geared and supercharged and geared Jaguar or geared Jaguar Major with geared fan or supercharger.

Argosy, 20-passenger airliner, as used for four years by Messrs. Imperial Airways Ltd., fitted with three geared Jaguars.

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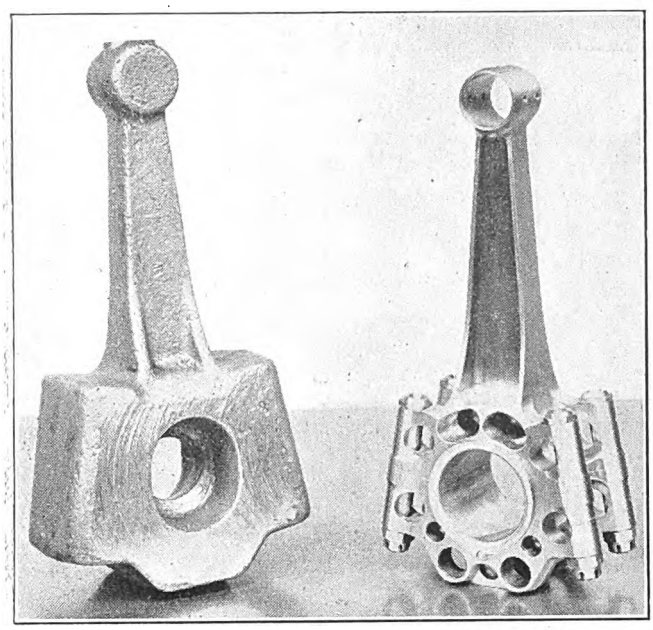


The rough forging and the finished master-rod of a Jaguar engine. The forging weighs 42½ lbs. and the finished rod 10 lbs. 11½ ozs.

La pièce en forge grosse et la bielle maîtresse d'un moteur Jaguar. La pièce en forge pèse 19.3 kilos. et la bielle finie 4.85 kilos.

La pieza forjada en bruto y la biela maestra de un motor Jaguar. La pieza de forja pesa 19.3 kilos. y la biela terminada 4.85 kilos.

as many as six sparking-plug bosses in different positions and making various tests with a plug in each position. Valve timing and ignition settings are experimented with. Following this an endurance test is made to prove the mechanical reliability of the various parts. In addition to this, endurance tests are also made on valves and pistons of various designs and material.

A stroboscopic examination of the valve gear is made on a special motor-driven apparatus on which the behaviour of the valve springs and other parts can be observed. All these developments may take place two years before the complete new engine using these parts is running on the bed.

The new engine is first installed on a special mounting fitted with wheels and running on rails so that the unit can be wheeled forward into the mouth of the air-tunnel and coupled up to the shafting connecting it with the brake-testing apparatus. It is then cowled in and the testing equipment and piping are connected.

Starting up a new engine is a much simpler task to-day than it used to be, for hand or gas starters are now available for all types. The hand-starter is geared down 12 to 1, and the routine is first to prime the engine and then to turn the hand-starter, while the hand-magneto is turned by another mechanic.

The gas-starter apparatus consists of a tank containing air at a pressure of 100 lbs. per square inch and a pipe-line, in which are fitted a valve and funnel to allow the entry of pètrol. When the valve is turned off the compressed air is turned on and blows the petrol in vaporised form into the engine.

A new engine will only turn over at 15 to 20 r.p.m., and for this reason the hand-starting magneto is used to fire the mixture. This is standard practice when starting up, for the main magneto is only switched on when the engine starts. The hand-starter magneto produces a more retarded spark because it is wired up to a specially retarded brush on the engine magnetos.

For the first two or three hours the engine is run as light as possible and is under the very careful scrutiny of a number of experts. During this period certain auxiliary oil leads are disconnected from time to time, so as to make sure that oil is flowing properly. In some engines there are auxiliary oil-pumps, and the amount of oil delivered by these pumps is carefully measured from time to time, so as to ensure that the amount corresponds with that laid down by the Drawing Office.

After the period of preliminary running the engine is opened up to 1,000 r.p.m., and the routine described above is repeated. The same system is observed again, until by easy stages the engine reaches full power.

When this has been got, tuning-up starts and special attention is paid to carburettor, magneto and valve settings —a process that is apt to be long and tedious. During all this time the engine-testing staff work in the closest co-operation with the Drawing Office, and the performance of the engine is most carefully watched.

When the engine has at last been brought into perfect condition it is put up for a two hours' run, during which the consumption is measured and the temperature of the oil at various points is taken by means of thermometers let into the pipe-lines. One measures the temperature of the oil entering the engine, and two measure the temperature of the oil leaving the engine.

The temperature of the cylinders is measured by thermocouples of ring type which are placed under the sparking-plugs, and by a peg-couple made by Armstrong Siddeley Motors Ltd.

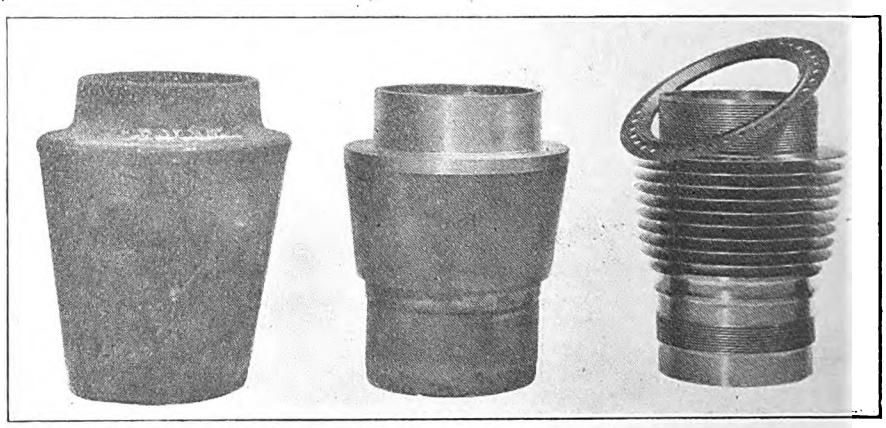
The behaviour of the engine is continually noted, and a test is taken at 90 per cent. of normal power on a Heenan and Froude water-brake. The last five minutes of this test is run at full throttle.

The engine is then returned to the shops and completely stripped down. Every part is passed to the Siddeley Inspection Department, where it is placed under the microscope and inspected for wear, cracks or fractures. During this period the A.I.D. and the Drawing Office keep in the closest touch. If the engine is reported satisfactory it is rebuilt and submitted to a 100 hours' development test at 90 per cent. of full power. The object of this test is to discover and then correct any defects that may develop.

When the engine has done this test it is ready for the Air Ministry 100 hours' type test. This includes a special schedule of power-curves and throttle-curves, ten non-stop runs of ten hours each (five of which must be made with an airscrew to test the thrust-bearings and exhaust-collector rings), and, finally at the end of the 100 hours, high-power and high-speed tests and more power and throttle curves.

Between the ten-hour tests only top adjustments are permitted, filters and plugs may be cleaned and valve-clearances set. During the whole test A.I.D. officials observe the running of the engine, and a very complete and accurate log is kept of the engine's running and the adjustments made.

This test is naturally a very anxious time for the staff. A gradual fall in power, or an increase in temperature, or a drop in boost (pressure in the induction system) are the unwelcome symptoms that all is not well within, which may necessitate the engine being stopped for inspection. This, of course, spoils that particular ten hours' non-stop test. If no adjustments are needed the test may continue, but if serious adjustments have to be made the whole test will have to be done over again.



Stages in the machining of a Jaguar cylinder. The forging on the left weighs 57 lbs. and the finished cylinder 14 lbs.

Différentes phases dans les travaux à la machine d'un cylindre Jaguar. La pièce en forge à gauche pèse 26 kilos. et le cylindre fini 6.3 kilos.

Etapas en los trabajos a máquina de un cilindro Jaguar. La pieza forjada a la izquierda pesa 26 kilos. y el cilindro terminado 6.3 kilos.

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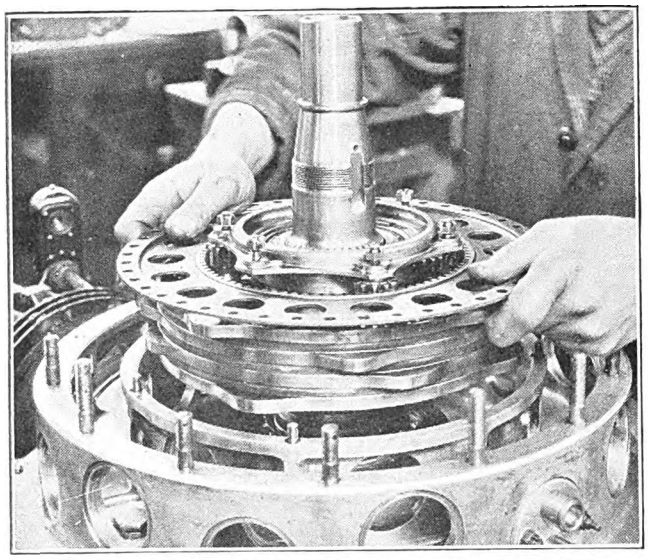


Assembling the timing gear of a Jaguar engine.

En train de monter le mécanisme de réglage d'un moteur Jaguar.

Montaje del mecanismo de reglaje de un motor Jaguar.

When once the 100 hours' type test has been done satisfactorily the engine is hall-marked as an approved type. Then it goes into production on the rating declared by the type-test engine. If later on the makers make such improvements that a higher rating is desired, they must do another 100 hours' type-test to qualify for Air Ministry work.

This, then, is the routine adopted for a new design of engine. The ordinary production engine, already proved in its type-test, undergoes a less complicated series of tests —but they are prolonged enough to add considerably to the cost of the engine.

When built it is "run in" at about 900 r.p.m. for two hours, and it is then placed on the test-bed for a two hours' power-test. After this it is returned to the shops and stripped down completely so that each component part may be carefully inspected. It is then re-built, and, if no parts have been changed, submitted for a final half-hour's test. But, if any parts have been changed, the engine must again undergo a two hours' test, a strip, another inspection and a half-hour's final run.

THE TEST PLANT.

The Armstrong Siddeley testing plant for air-cooled engines consists of seven Heenan and Froude dynamometers and two airscrew test-beds, each of which is installed in a separate building.

Each of the dynamometer test-beds comprises an electric motor, varying from the 600 h.p. used for the Leopard down to the 50 h.p. for the Genet. The function of these motors is to create a current of air at 100 to 120 m.p.h., with which the engine is cooled under test. This current of air is conveyed under the Heenan and Froude dynamometer in a tunnel, the mouth of which is carefully cowled up to the cylinders so as to ensure the greatest cooling efficiency.

A coupling-shaft passes through part of the tunnel and unites the crank-shaft with the dynamometer.

Each unit of the plant measures more than five yards across. Its length is over ten yards, and the whole is capable of an average weekly test output of over 40,000 B.H.P. hours.

Its operation by day, and especially at dusk, is most impressive. The accompanying photographs show one of the test-beds. The water-cooled exhaust-collector and control mounting for the engine, air tunnel, dynamometer and motor are clearly seen. The various parts of the plant are as follows:—

1, The hand-starter magneto. 2, The revolution counter. 3, The oil-pressure gauge. 4, The throttle and altitude controls. 5, The oil-strainer.

6, The dynamometer spring-balance. 7, The dynamometer revolution-counter. 8, The electric motor driving the cooling-fan. 9, The air inlet to the depression-box (for supercharger and altitude tests). 10, The lifting tackle.

11, The water-cooled exhaust-collector. 12, The air-storage tank for the gas-starters. 13, The petrol-tank. 14, The compressor for filling the air-storage tank. 15, The pump for filling the tanks with special mixture.

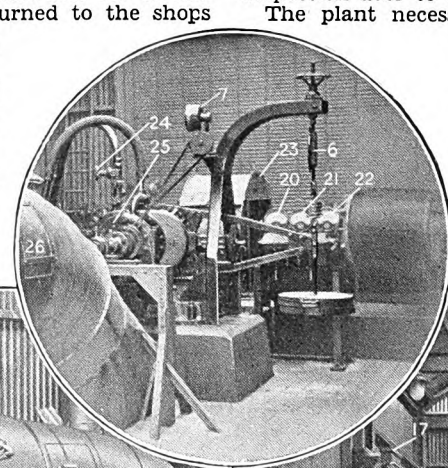
16, Calorifier for oil heating (to 158 deg. F.). 17, Water-cooler for oil. 18, The control valves for water to exhaust-collector. 19, The ratchet lever for moving the under-carriage.

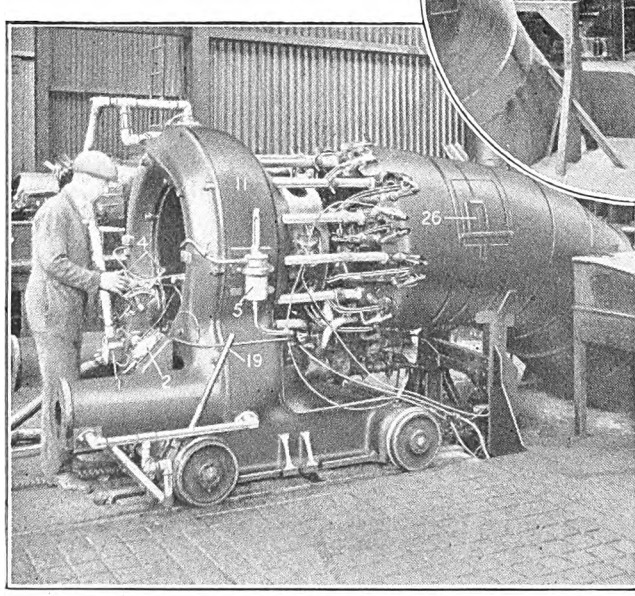
20, 21, 22, Ampère meter to fan motor.

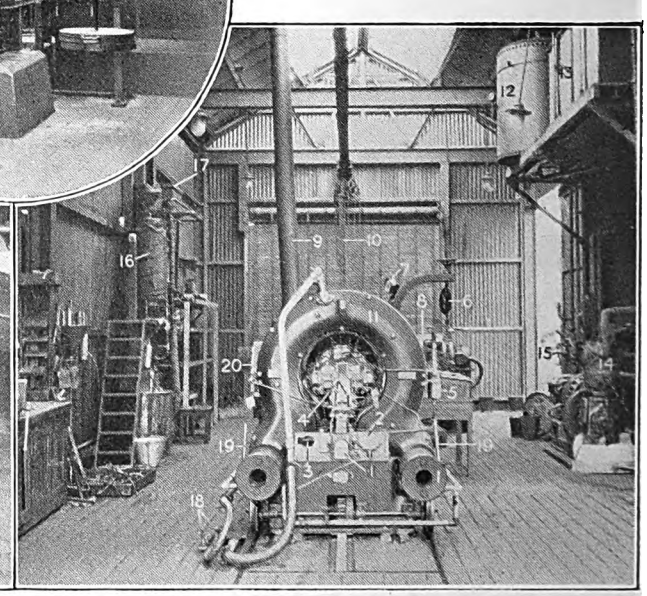
23, The cooling-fan. 24, The water-control valve to the dynamometer. 25, The water dynamometer. 26, The inspection door to the air-tunnel.

The plant necessary for circulating the water through the brakes, silencer and oil temperature control in the various test-beds in itself forms a considerable piece of apparatus.

The water supply is drawn from a cooling tower and on its descent to the test-beds passes through gauze filters and an upwardly flowing air stream which help to clean and cool it.







Three views of one of the aero-engine test beds at the works of Armstrong Siddeley Motors Ltd.

Trois vues d'un des bancs d'essais des moteurs d'aviation dans les Usines Armstrong Siddeley Motors, Ltd.

Tres vistas de uno de los bancos de pruebas de los motores de aviación en los Talleres de Armstrong Siddeley Motors, Ltd.

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- The M. P. Hollow Steel Propeller is the only one on the market which possesses this special feature of adjustability of pitch. It thus combines the advantages of a standard propeller with that of a propeller designed to give best performance, or to give a special type of performance, on any individual aircraft.
- The adjustment can be effected in a few moments, and is fool-proof. As an example of its advantages, it is possible to adjust the pitch so that maximum revolutions are obtained during take-off or climb, or alternatively, so that maximum efficiency is obtained in level flight.
- Arising out of the adjustability of pitch is the fact that the blades are detachable, and therefore one blade weighing, in the case of the light aeroplane propeller, under 8 lbs., suffices as a spare. It is significant that in spite of these exclusive features, the weight of the propeller as a whole is low. For instance, the weight, complete with hub, of the light aeroplane propeller, is 23½ lbs.

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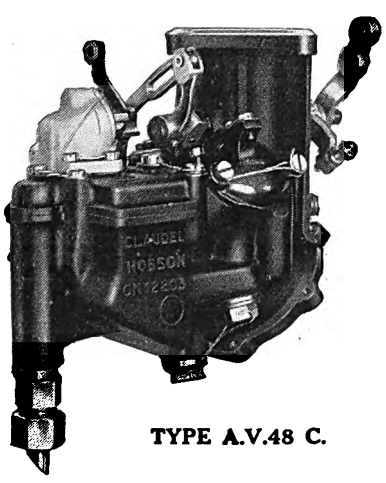

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THE DESIGN OF SUPERCHARGERS.

WITH PARTICULAR REFERENCE TO THE SUCCESSFUL TYPE DEVELOPED BY ARMSTRONG SIDDELEY MOTORS LTD.

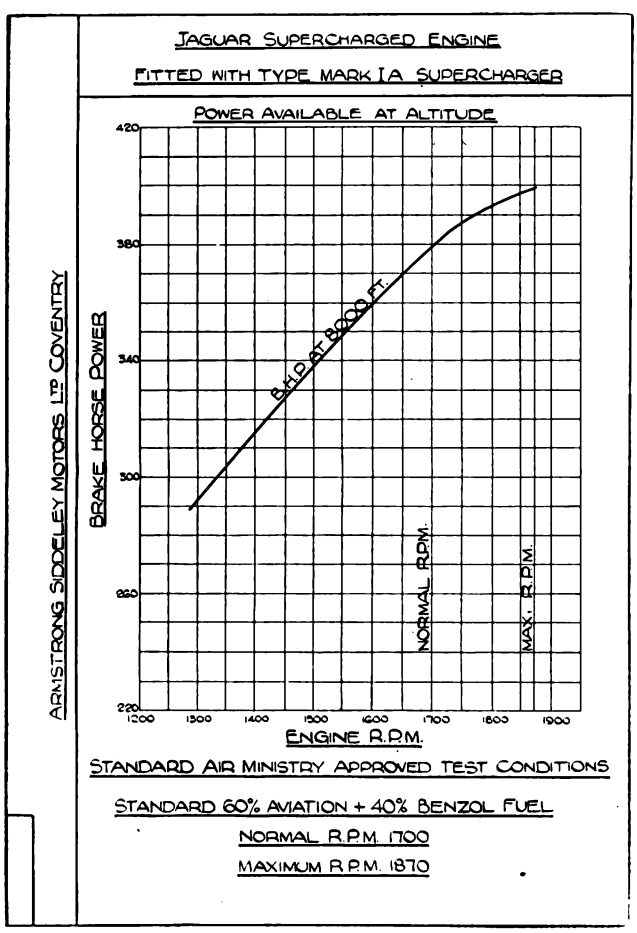
In considering the supercharging of aircraft engines where bulk and weight are of paramount importance, the positive-displacement type of blower is at a considerable disadvantage and attention is naturally turned to the centrifugal fan. This type scores not only on account of its compact form but also because it adapts itself very conveniently to the engine, particularly when this is of the radial type.

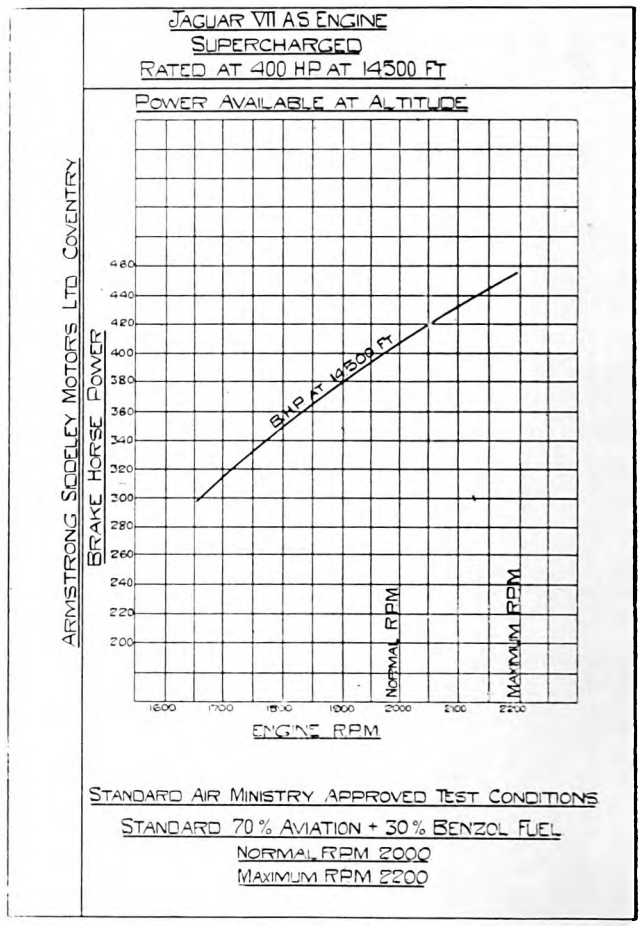
The design and adaptation of a supercharger unit of the size required presents a new set of problems in addition to those normally associated with blower design. If a single stage unit is decided upon modern requirements call for a compression ratio of 1.6 to 1, or even higher, a figure which is usually obtained only in the largest multi-stage compressors used for stationary work, which normally have an average compression ratio of 1.3 to 1.4 to 1 per stage. The efficiency of the fan and diffuser passages has therefore to be high, particularly if for reasons of simplicity an intercooler is dispensed with.

To make a compact unit the rotor must be small in diameter with, as a consequence, a high rotational speed. The design and mounting of ball and roller bearings have therefore to receive particular attention as although they may be theoretically lightly loaded for their size, they have to stand up to speeds of 20,000 to 30,000 r.p.m. Not only must the bearings be in accurate alignment, but each must have clean oil in small but constant quantities.

Although light in weight, the rotor has considerable inertia by reason of its high speed. In fact the fly-wheel effect of the rotor can be an appreciable proportion of that of the airscrew. This additional fly-wheel may have the effect of introducing a torsional vibration period within the working range of the engine, and this can be obviated either by providing a spring-drive between the crank-shaft and the supercharger, or as in the case of Armstrong Siddeley units by means of a floating member, which, while always providing a positive drive between crank-shaft and blower allows sufficient flexibility to isolate the drive from the influence of crank-shaft movement due to torque variations and other fluctuating influences.

Truly epicyclic gearing has been successfully used for the drive but in the standard Armstrong Siddeley units the 13 to 1 ratio is obtained in two trains of normal gearing, the gears of which are made from nickel steel with all teeth hardened and ground.





The single stage gear-driven type of supercharger unit has been concentrated upon for production engines.

In the original type, which incidentally is claimed to be the first practical supercharger to be fitted as standard to Service aircraft, the rotor has radial blades, supported only at the hub, and machined from a solid duralumin forging. Stationary inlet guide-vanes were provided, with short straight outlet diffuser blades.

The drive to the rotor was taken from the rear-end of the crank-shaft through two trains of gears. The whole gearing was carried in the supercharger casing and was removable as a complete unit. It had a floating member interposed between the crank-shaft and the supercharger to take care of engine torque fluctuations. This design of gearing proved to be very successful and has been retained with only slight modifications throughout subsequent developments.

This unit was in service in 1925 and with it the Jaguar engine gave 380 b.h.p. at 1,700 r.p.m. at 8,000 feet.

In the next stage the rotor was made in steel and a shroud provided additional support to the radial blades for part of their length. It also had curved entrance vanes integral with the rotor, and the whole was machined from a solid forging. The outlet diffuser blades were also curved and lengthened to provide a more gradual expansion for the gases and generally increase efficiency at this point.

Considerable improvement in performance was obtained with this unit, and as a result of the experience gained, it was decided to proceed to the present production design.

In this unit, the outlet diffuser blades are dispensed with altogether, and the gases on their exit from the rotor have an unobstructed passage to the induction chamber.

In addition to the advantages obtained by reduced frictional losses, this construction lends itself to the provision of a comparatively large surface area to be traversed by the gases on their way from the rotor to the induction casing, and this acts to a useful extent as an intercooler.

With this design, it was found to be possible to reduce the diameter of the rotor compared with previous types and at the same time to obtain a higher boost pressure. This part is now made in two portions. The radial blades are supported by a full diameter shroud on one side and are made from duralumin with the curved entrance blades of steel pressed on to the hub.

This unit has been successfully fitted to the geared as well as to the direct-drive engines. With it the Jaguar engine develops 400 b.h.p. at 2,000 r.p.m. at 14,500 feet, which represents a considerable advance on the earliest model.

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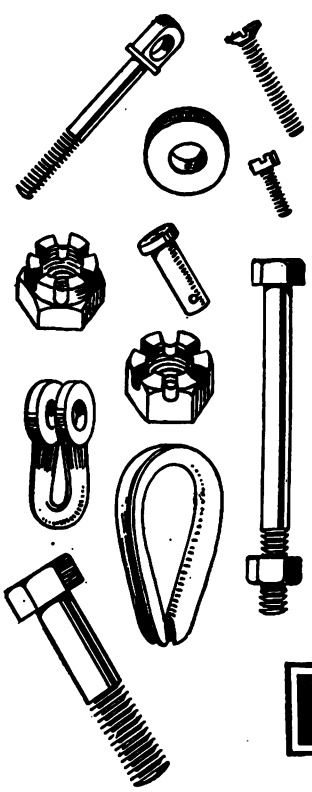

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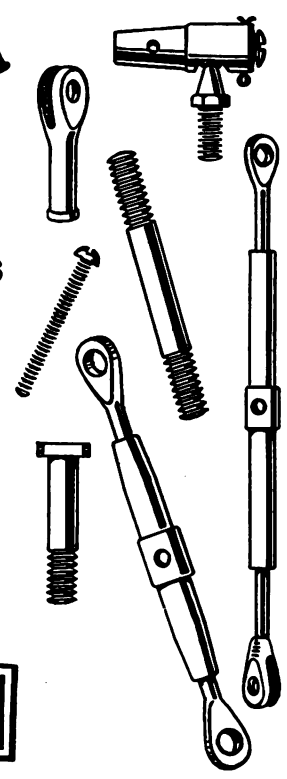

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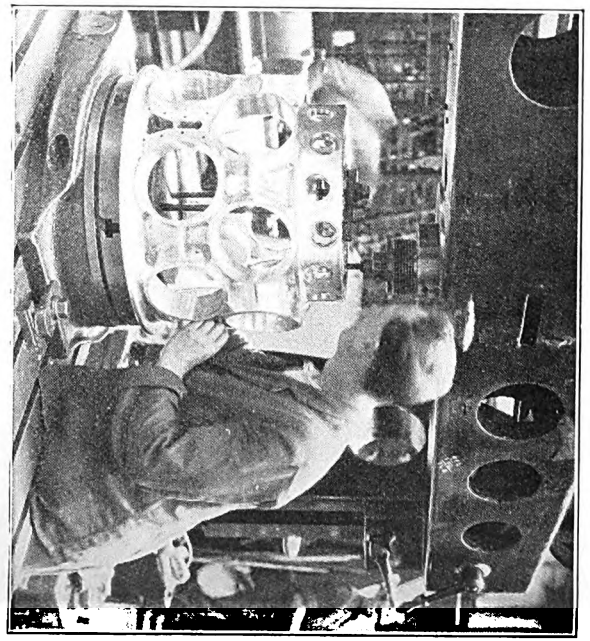
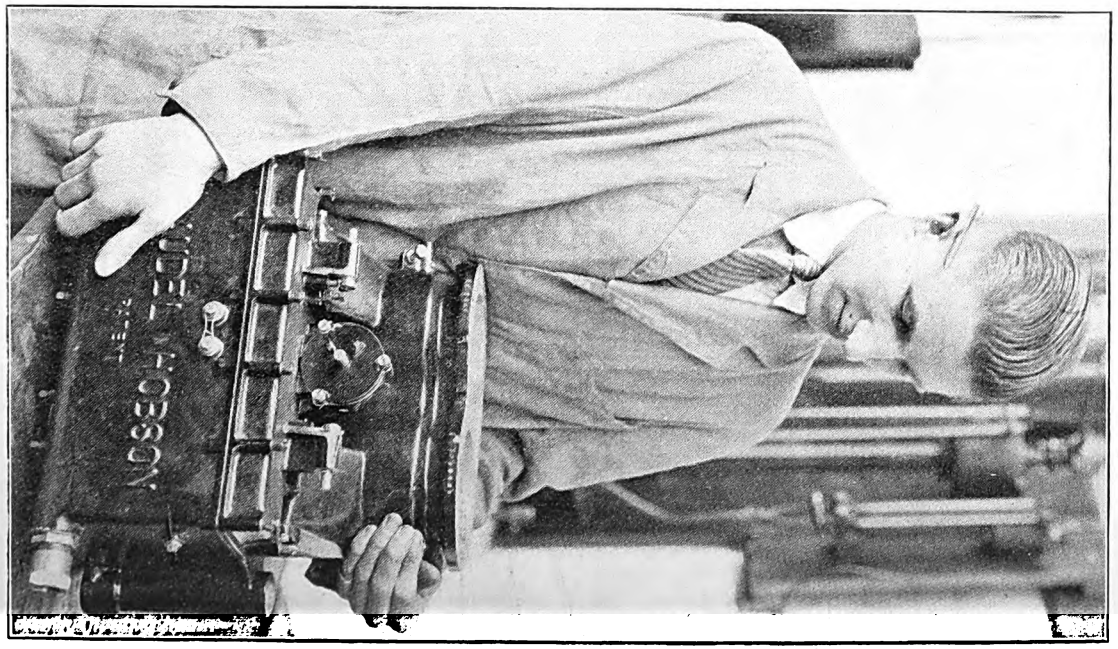
LEADING PARTICULARS OF ARMSTRONG SIDDELEY AIR-COOLED ENGINES.

TYPE.	Leopard. G.	Jaguar Major (G). P.F.	G.F.	S.	Jaguar. P.	G.	S.	G. & S	Lynx. P.	G.	S.	Mongoose P.	Genet Major. P.	G.	Genet. P.
No. of Cylinders	14	14			14				7			5	5		5
Bore	6" (152.4 mm.)	5.25" (133.3 mm.)			5" (127.0 mm.)				5" (127.0 mm.)			5" (127.0mm)	4.25" (108 0 mm.)		4" (101.6mm)
Stroke	7.5" (190.5 mm.)	5.5" (139.7 mm.)			5.5" (139.7 mm.)				5.5" (139.7mm.)			5.5" (139.7mm)	4.5" (114.3 mm.)		4" (101.6mm)
Comp. ratio	5/1	5/1			5/1				5/1			5/1	5.2/1		5.25/1
R.P.M, normal	1700	2000			1700	2000	1700	2000	1900	2000	1900	1850	2200		2200
B.H.P. Normal at sea level — Rated	800	500	525	—	400	460	—	—	215	215	—	150	100		80
B.H.P. Normal at sea level — Actual	815	510	—	465	410	480	365	360	218	220	180	155	103		82
Max. B.H.P. at max. R.P.M. at sea level	860	545	560	482	440	510	380	380	230	235	190	165	110		88
Gear ratio	.633		.657			.657		.657		.657		—	—	.663	—
Rated Power at rated altitude at normal R.P.M.	—	—	525 3000' (915 m.)	510 11500' (3505 m.)	—	—	385 9500' (2895 m.)	400 15000 (4572 m.)	—	—	200 11500' (3505 m.)	—	—	—	—
Engine weight	1700 lbs. (771.3 kg.)	915 lbs. (415 kg)	985 lbs. (447.7 kg.)	996 lbs. (452.7 kg.)	856 lbs. (388.3 kg.)	952 lbs. (431.8 kg)	940 lbs. (426 4 kg.)	1048 lbs. (475.4 kg.)	548 lbs. (248.6 kg.)	640 lbs. (290.3 kg.)	570 lbs. (258.5 kg.)	365 lbs. (165.9 kg.)	250 lbs. (113 5 kg)	280 lbs. (1.27 kg)	210 lbs. (95.4 kg.)
Weight per h.p.	1.97 lbs. (.89 kg.)	1.68 lb. (.76 kg.)	1.75 lbs. (.79 kg)	1.98 lbs. (.9 kg.)	1.94 lbs. (.88 kg.)	1.86 lbs. (.84 kg.)	2.21 lbs. (1.09 kg.)	2.27 lbs. 1.03 kg.)	2.38 lbs. (1.08 kg)	2.72 lbs. (1.23 kg.)	2.48 lbs. (1.11 kg.)	2 21 lbs. (1.00 kg.)	2.5 lbs. (1.13 kg.)	2.8 lbs. (127 kg.)	2.38 lbs. (1.08 kg.)
Overall Measurements — Diameter	58" (1.45 m.)		46.75" (1.187 m.)		45.6" (1.137 m.)	45.6" (1.137 m.)	45.6" (1.137 m.)	45.6" (1.137 m.)	45.6" (1.137m.)	45.6" (1.137 m.)	45.6" (1 137 m.)	45.6" (1.137 m.)	38" (.65 m)		34" (.85 m)
Overall Measurements — Length	60,85" (1.521 m.)		61.6" (1.564 m.)		47.275" (1 181 m.)	52.9" (1.322 m.)	53.9" (1.33 m.)	58.825" (1.47 m.)	40.25" (1.006m.)	46.75" (1.168 m.)	43.635" (1.09 m.)	35.65" (.891 m.)	(.905 m.)		28.53" (.713 m)

P = Plain. G = Geared. P.F. = Paddle Fan. G.F. = Geared Fan. S. = Supercharged.



Machining the crankcase of a Jaguar engine.
Des travaux à la machine dans le carter d'un moteur Jaguar.
Trabajos a máquina en el cárter de un motor Jaguar.



The Claudel-Hobson carburetter for the Armstrong Siddeley Leopard engine.
Le carburateur Claudel-Hobson pour le moteur Armstrong Siddeley Leopard.
El carburador Claudel-Hobson para el motor Armstrong Siddeley Leopard.

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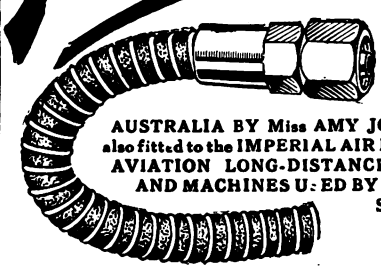

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The main support of the model is taken from a light frame which is supported from the middle of the three balances. This frame has a square base and two triangular sides—each with the apex at the top. These apices are interconnected by a tube on which are two more pivot-points which carry an auxiliary frame.

From the first frame is supported the model to be tested, and from the auxiliary frame, the axis of which is at right angles to the axis of the main frame, is supported the tail of the model, in such a way that the angle of incidence can be adjusted without interfering with any part of the balance or suspension.

From the centre point of the tube connecting the apices of the auxiliary frame is carried an arm on which there is a sliding bracket which actually supports the tail of the model by a wire. This arm can be moved about a graduated arc which connects the bases of the triangular sides of the auxiliary frame.

At the bottom of the graduated arc is a small bracket which carries a vertical wire to the balance directly above it.

Lift forces are thus transmitted to the vertical balances carrying the main and auxiliary frames, and the lift of the tail of the model is distributed between the two balances.

Drag of the model is measured by a horizontal wire which is fastened to the bottom of the main frame. On the down-wind side is a counterpoise, and on the up-wind side an attachment is made to a wire at 45 degrees to the horizontal fastened to the roof of the tunnel and also direct vertically to the drag balance.

For the measuring of air-speed the N.P.L. duplex type of manometer is used. This consists of two glass limbs, one of which has an inner tube with its end nearly midway between the top and bottom of the outer jacket. This is not joined to the inner tube, but serves as a jacket for oil. The two glass limbs are joined by a rubber tube and are filled with distilled water, which comes in contact with the oil in the jacketted limb and forms a miniscus. A simple optical arrangement projects the miniscus on to a screen, where it can be adjusted to a hair-line. The other limb can be raised or lowered by a fine-pitch screw fitted with a micrometer.

ACCESSORIES AFTER THE FACT.

HIGH-GRADE STEELS.

The production of high-grade steels represents one of the principal activities of William Jessop and Sons Ltd. This firm, which was founded in 1774, quickly specialised in its earliest days in the manufacture of the highest possible grades of tool-steels with such success that over one hundred years ago these had acquired a world-wide reputation. And this reputation is maintained to this day. With this unique experience they were, therefore, in a very favourable position to produce the speciall alloy steels which were needed for the development of the Automobile Industry, followed up more recently by the Aircraft Industry.

They were among the early manufacturers of alloy steels for crank-shafts and connecting-rods, and nearly thirty years ago installed special plant for the forging and machining of these parts. They have always realised that these special steels must be produced under expert supervision, and close control from the point of view of composition, and must be made from carefully selected materials of the highest possible grade.

Further to ensure soundness, freedom from segregation, and uniformity in composition and structure, special melting plant is desirable. The result is that to-day this firm are equipped to produce steel made in special Siemens acid furnaces, electric arc furnaces, high-frequency furnace and by the coke crucible process. The latter is the process that has been used for upwards of one hundred and fifty years in making the highest grade steel. And improvements have been made here which enable the closest possible control to be exercised, which results in an absolutely uniform product almost commercially free from impurities such as sulphur and phosphorus.

For some years they have been supplying rough-machined and finished-machined crank-shafts of all types to the leading firms in the Automobile and Aircraft Industries, and some of the most powerful aero-engines in the World are equipped with crank-shafts made at the Brightside Works.

Special attention has been given to the production of steel for connecting-rods.

Very early the firm recognised that there would be an insistent demand for a reliable valve-steel, and some years ago very thorough research was made on this subject, with the result that in their "G.2" Super-Steel Jessop's rightly claim to possess a steel capable of giving complete satisfaction under the most strenuous conditions. This is an austenitic steel which has high-tensile strength at high temperatures. It is readily forged, and heat-treatment is a very simple operation. It is tough at all temperatures, and so withstands shock while still retaining its form.

Repeated heating and cooling does not cause it to become hard and brittle, and it can therefore be relied upon to retain its original properties after continuous running at high temperatures, with the very big advantage that expansion is practically uniform over the whole range of temperatures met with in internal combustion engines. It does not readily scale at high temperatures and withstands pitting and corrosion. It has been used by a number of important aero-engine makers with complete success.

Ball and roller bearings are now used to a certain extent on all aero-engines, and Jessop's for many years have manufactured, in their "H.2" Steel, material that has given satisfaction in the production of these important parts.

As pioneers in the production of cold-rolled steel they were already prepared to supply this material when the demand arose following the development of the all-metal aeroplane, and to-day are in the position to supply strip-steel to any of the Air Ministry specifications—though the firm finds from experience that the demand for annealed or semi-hard rolled strip tends to increase at the expense of heat-treated strip. This is explained by the fact that many of the aircraft manufacturers in forming the spars prefer to manipulate the annealed material and heat-treat afterwards.

For many years the Brightside Works have been renowned for the excellence of their hot-rolled sheets, and the experience gained in this section has been applied with success to the manipulation of the various grades of material required in the construction of modern aeroplanes.

The supply of rustless and stainless materials in bar, sheet or strip to all aircraft specifications forms a very important part of the activities at Brightside Works—where the very latest and most up-to-date equipment has been installed for dealing with this material. Some of the largest flying-boats that have been made in this country are built up from Jessop's "R.4" Special Stainless Steel, which has also been exported in large quantities to important countries where aircraft are built—including the Far East.

From this brief resumé readers will realise that the activities of William Jessop and Sons cover the supply of all the materials which the production of the modern aeroplane demands in the form of Carbon, Alloy, Rustless and Stainless Steels, whether these be in the form of tools and dies for the workshop, or for crank-shafts, connecting-rods, valves, airscrew blades, gears, or any other component.

STEEL TUBING.

As is well known, Sir W. G. Armstrong Whitworth Aircraft, Ltd. are pioneers in steel aircraft and they use steel tubes to a very large extent.

British specifications for steel tubes cover a large range and tubing can be obtained with almost any desired properties.

The Reynolds Tubing Co., Ltd. of Tyseley, Birmingham, supply very large quantities of their aircraft tubing to constructors using metal construction, whether it be for welding or mechanical jointed construction.

Sir W. G. Armstrong Whitworth Aircraft, Ltd. favour the mechanical jointed method and use tubing to B.E.S.A. Specification T.5. for their fuselages.

For the wings, although the company largely uses special strip sections, quite an amount of straight and manipulated steel tubes are also used. The majority of these are made of 24G tubing to B.E.S.A. Specification T.1. Taking into consideration the thin metal used, the Reynolds Tube Co. are getting very satisfactory results with this material.

In addition to the tubes mentioned, the Reynolds Tube Company supply all kinds of streamline-sectioned tubes to the Armstrong Whitworth firm for interplane struts, undercarriage legs, etc.

For Armstrong Siddeley Motors Ltd., the Reynolds Tube Co. supply various tubes for the production of exhaust and inlet, oil and starter pipes, etc.

One of the most interesting varieties of tubes supplied is a special swaged valve-tappet tube which is reduced at either end to within very close dimensional limits. These are made from tubing to Specification T.5 and they are noticeable for the very fine finish which is evident with all Reynolds Aircraft Tubing, whether it be round or other section tubes or manipulated parts.

The Reynolds Tubing Co. Ltd are now issuing a revised

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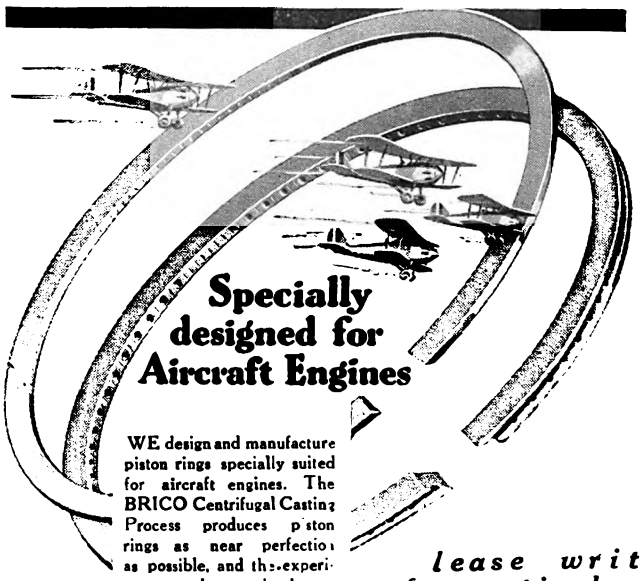

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edition of their Aircraft Catalogue which has been enlarged and brought thoroughly up-to-date. This should be most useful in Buying Departments, Drawing Offices and other departments of all Aircraft Works. Copies of this catalogue may be had on application to: The Reynolds Tubing Co., Ltd., Hay Hall Works, Tyseley, Birmingham.

STEEL STRIP.

J. J. Habershon and Sons Ltd., of Holmes Mills, Rotherham, have been established for over 100 years and are the largest cold rollers in this country.

The firm specialises in the production of steel strip suitable for building up aircraft spars, and quantities of this strip is supplied to Sir W. G. Armstrong Whitworth Aircraft Ltd. for spar construction.

This strip is made by J. J. Habershon and Sons to the following specifications: D.T.D. 100, S.50A, D.T.D. 57 and D.T.D. 42H. This material is rolled, treated and built into wing spars, ribs, etc., for all Armstrong Whitworth production type aircraft, including the Argosy, Atlas and Siskin.

The whole of the steel strip used in the construction of the Airship R.101 was supplied by this firm, and all the leading Aircraft constructors in this country are using Habershon strip.

HIGH DUTY ALLOYS.

Few classes of material have raised such high hopes among those who originally produced them or so many disappointments among those who have sought to use them as some of the light alloys of high tensile strength. So a firm which has fulfilled all hopes is worthy of special attention.

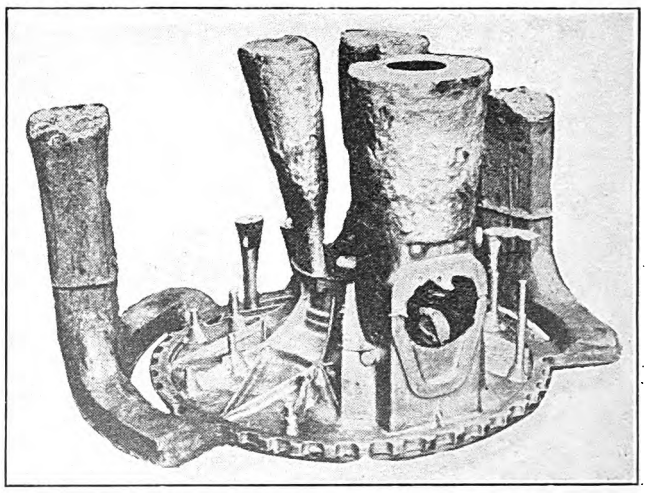
High Duty Alloys Ltd. of Slough have laid themselves out to produce light alloys of types required by the Aircraft and other exacting industries in commercial quantities with laboratory-like accuracy.. Exceedingly careful control is kept over the composition of all alloys made, and as the result of this control their products are found to be exceedingly uniform and satisfactory in every way. Rejections of material or finished parts for aircraft engines for defective material are practically unknown.

One of the most recent alloys produced by this firm is known as "Hiduminium R.R. 50," and this is regarded by leading engineers, in the Aircraft Industry especially, as representing a distinct advance in the uses of aluminium. It is the outcome of careful work done by Messrs. Hall and Bradbury, who have charge of the Rolls-Royce laboratory, and much development work in regard to this material has been done by High Duty Alloys Ltd.

So much is thought of this material by the Rolls-Royce Company that the whole of their automobile and aero-engine aluminium castings are now made from it. The crank-case, cylinder-blocks and cylinder-heads, together with other aluminium castings of the Rolls-Royce "R" engine which won the 1929 Schneider Trophy and put up the World's speed record, were made in this new material.

The Company also produces other alloys, notably "Hiduminium" Y alloy and "Hiduminium DU" duralumin. The former in its forged state is guaranteed to develop from 22 to 27 tons per square inch ultimate strength, and the latter, which is to D.T.D. specification 18A, is guaranteed to develop between 25 to 30 tons per square inch ultimate tensile strength with an elongation of between 15 and 25 per cent.

High Duty Alloys Ltd. specialise in the production and working of all kinds of light alloys, and Mr. W. C. Devereux, the Managing Director of the firm, will be glad to place the resources of the Company at the services of any firm which has problems concerning these materials to solve.



A rough casting of a Jaguar fan induction cover in "Hiduminium" R.R. 50 alloy.

NON-FERROUS CASTINGS.

The Fozel Castings Co., Ltd., of Francis Street, Coventry has specialised in the supply of high-grade castings to Admiralty and Air Board and (later) Air Ministry specifications since the earliest days of Aviation.

This firm supplies the leading aircraft and aero-engine manufacturers, including Sir W. G. Armstrong Whitworth Aircraft Ltd. and Armstrong Siddeley Motors Ltd., with non-ferrous castings of every kind. They have laid down an extensive plant for the heat-treatment of alloys and are prepared to undertake any kind of work, for the Aircraft Industry in light metals, in fact, no job is either too small or too large for them.

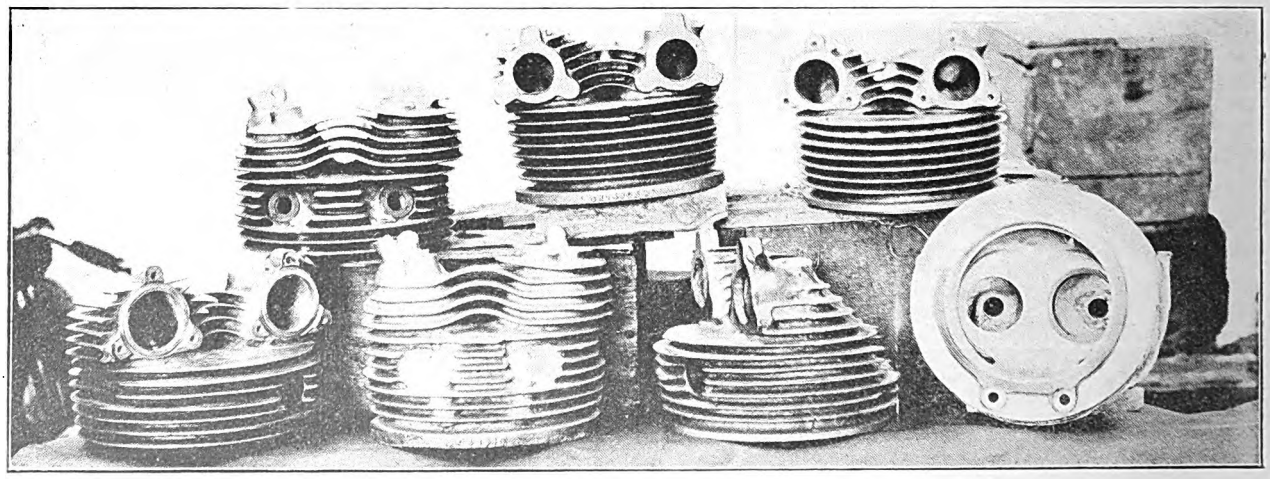
Their work includes crank-cases of all types and sizes, cylinder-heads, front and rears covers, induction cases, manifold pipes etc. They have supplied these components for the Leopard, Jaguar-Major, Jaguar, Lynx-Major, Lynx, Mongoose, Genet-Major and Genet in aluminium alloy, and the firm also specialises in castings in manganese bronze, aluminium bronze, gun-metal, phosphor-bronze, brass, etc. to official specifications. The company's modern and up-to-date foundries are thoroughly equipped for all kinds of aircraft castings and they cover a site of six acres in the most healthy part of Coventry.

The Fozel Castings Co. Ltd. is under the capable supervision of Mr. Arthur Saunders who will welcome any enquiries from the Aircraft Industry.

AIRCRAFT ACCESSORIES.

Rubery Owen and Co. began the manufacture of aircraft accessories so long as 20 years ago. Their early products consisted of eyebolts and strainers, as well as steel framework, both pressed and tubular. And as early as 1911 they had produced a small catalogue of aircraft parts.

To-day they are one of the largest manufacturers of aeroplane components. They produce, in high tensile steel, stainless steel, mild steel and duralumin, all manner of



A series of cylinder-head castings in "Hiduminium" R.R. 50 alloy.

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A.G.S. parts and their plant is fully equipped to turn out vast quantities of repetition work to any specification.

Rubery Owen components have been used in all the prominent British post-war flights, notably those of Sir Alan Cobham in the Siddeley Puma-engined D.H.50 to Rangoon and back, and in the Armstrong Siddeley Jaguar-engined D.H.50 from England to South Africa and back and to Australia and back.

SHEET METAL WORK.

The Gallay Radiator Co., Ltd. of 103/105 Scrubbs Lane, Willesden, London, N.W.10, in addition to making radiators, as their name suggests, also supply petrol and oil tanks and general sheet metal work to the Aircraft Industry.

They are contractors to Sir. W G. Armstrong Whitworth Aircraft, Ltd. for petrol and oil tanks and the high degree of supervision which the Aircraft Industry in general and the Armstrong Whitworth company in particular, exercise over their contracts is evidence that the Gallay Radiator Co., Ltd. have the necessary facilities and ability to deal with the most high-grade and exacting type of sheet-metal work required.

The Gallay Radiator Co., Ltd. are approved by the Air Ministry and are prepared to guarantee their work to the utmost degree.

METAL AIRCRAFT FITMENTS.

The Brooke Tool Manufacturing Co. Ltd., of Warwick Road, Greet, Birmingham, has supplied Sir W. G. Armstrong Whitworth Aircraft, Ltd. with large quantities of small aircraft components over a period of years.

This company attaches considerable importance to the production of machined aircraft material, and, as the attached photographs show, a very large portion of its up-to-date plant is devoted solely to this branch of work.

The capstan lathe department which is solely devoted to the manufacture of aircraft components is equipped with the very latest machinery, and only recently the company has acquired a new semi-automatic capstan lathe which is the largest of its type made in Birmingham. This fact is recorded to emphasise the anxiety felt by the firm to be prepared to undertake any work that it may be called up to do within the limits of existing machinery.

The Brooke Tool Manufacturing Co. is on the Air Ministry approved list, and the company will welcome enquiries from anyone who has metal aircraft problems to solve.

METAL PRESSINGS FOR AIRCRAFT.

M. Mole and Son have been manufacturing sheet metal and hot brass pressings for aircraft since the earliest days of flying. The firm was established in 1835 and has been on the A.L.D. approved list for many years.

Their up-to-date factory is in Charlotte and Newhall Streets, Birmingham, and large extensions to the factory were opened in January of this year.

The Company specialises in rib-struts, control-lever pressings, shims, tab-washers and all kinds of fixing plates, and a number of their products are used on the Armstrong Siddeley Lynx, Mongoose and Genet engines.

Other specialities of this firm are valve-rocker covers and stiffeners for the Armstrong Siddeley Jaguar engine. And they also turn out large quantities of oil-strainers, cable clamps, and brackets for Armstrong Siddeley engines in general.

In addition to their considerable activities in connection with the Aircraft Industry, M. Mole and Son have a large output of automobile and electrical fittings. And, incidentally, they make more automobile door-handles than any other firm in Europe.

REPETITION WORK.

The Diamond Screw and Cotter Co. Ltd., of Ronald Road, Bordesley Green, Birmingham, manufacture small repetition machine parts, including screwed rods, nipples, union nuts, adaptors, and a variety of other small parts which are used in the manufacture of Armstrong Whitworth aircraft and Armstrong Siddeley aero-engines.

This Company are fully approved by the A.I.D. and work in materials to all Air Ministry (B.E.S.A.) specifications.

Their experience extends over a number of years, and they are in a position to supply all manner of repetition and screwed parts, hinge, taper, cheese-head, and button-head pins, etc., in quantity, and of a quality that is high enough to meet the most exacting requirements.

VALVE SPRINGS.

J. H. Turner, of the Reliable Spring Works, Castle Street, Wolverhampton, specialises in the manufacture of every description of springs in any metal.

The firm's experience dates back to the very earliest days of aviation. The firm's products are used almost exclusively by Armstrong Siddeley Motors Ltd. in their range of aero-engines, and the list of achievements put up by Armstrong Siddeley engines can be safely said to have been made possible by Turner valve-springs, which have given faultless service under every possible condition.

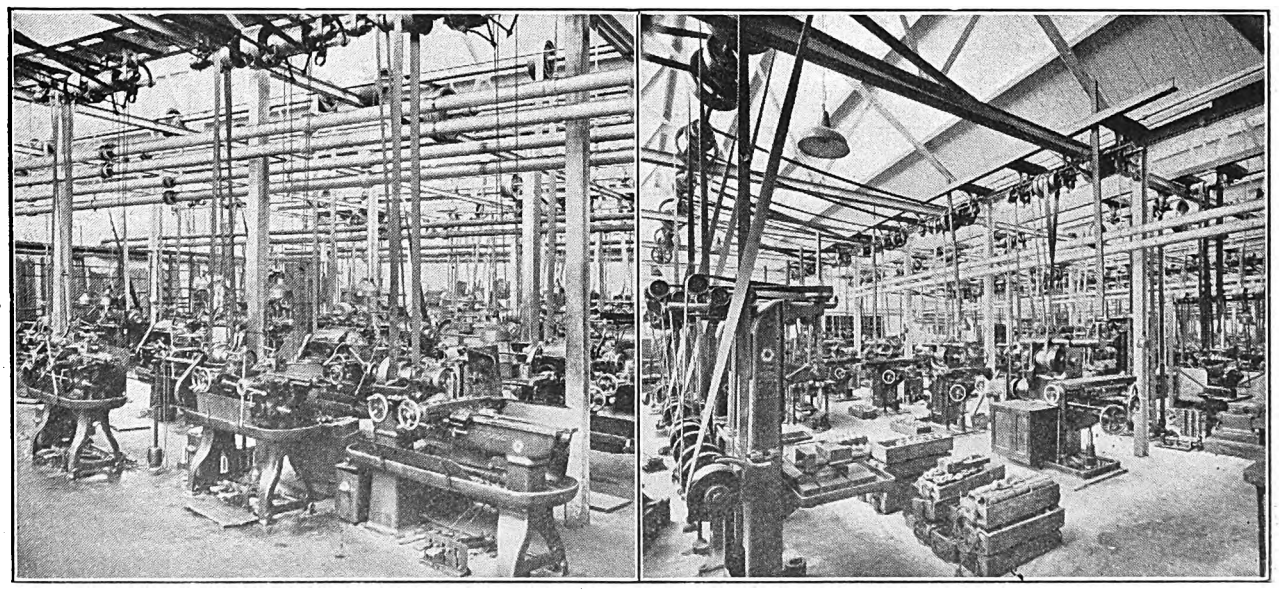
The flights of Sir Alan Cobham from England to Rangoon and back, to the Cape and back and to Australia and back, the King's Cups for 1923, 1924, 1925, and 1929, the Grosvenor Cup for 1926 and a number of World's Light Aeroplane Records for Distance, Height and Endurance were made with Siddeley engines fitted with Turner valve-springs.

Armstrong Siddeley engines are in use in thirty-three countries all over the World for Service and civil use, and Turner valve-springs are giving unquestioned service wherever Armstrong Siddeley engines are in use.

B.T.H. MAGNETOS.

The magnetos fitted to the Armstrong Siddeley Genet and Genet Major engines are of the type "GL-5" manufactured by the British Thomson-Houston Co. Ltd., Coventry. These 5-cylinder magnetos are arranged for spigot mounting and have several distinctive features not found in the 4-cylinder magnetos.

For example, the distributor brush holder is provided with a trailing point 36½° behind the main brush. This is used in connection with a hand-starting magneto when starting the engine. The distributor moulding is of unique construction and operates with a small spark-gap between.



Two views of the works of the Brooke Tool Manufacturing Co. Ltd. On the left is the capstan lathe department and on the right the drilling and milling department.

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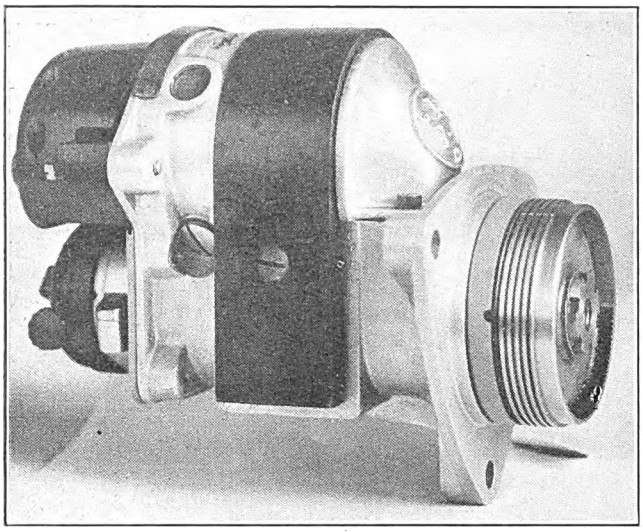


The B.T.H. GL-5 magneto.

the metal brush and segments. The distributor is made in two sections to facilitate assembly of the high-tension leads.

The high-tension leads are assembled in radial grooves in the back half of the distributor and are pierced by spikes which are an integral part of the moulded-in inserts. The front portion of the distributor is secured to the back portion by two screws, and the whole is held to the endplate by two bolts. The H.T. leads are thus very accessible, good electrical contact is assured, and they are securely clamped in position. As this type of magneto is for 5-cylinder engines, it is driven at 1¼ times engine crank-shaft speed.

The magnetos for the Armstrong Siddeley Mongoose, Lynx, Lynx-Major, Jaguar, Jaguar-Major and Leopard engines are of the B.T.H. "SC" Polar Inductor type. The first three engines are fitted with the type SC-7 magneto and the remainder with the type SC-14 magneto, and both are fundamentally the same. They are spigot-mounted, stationary-armature machines, specially developed to meet the requirements of aeroplane engine ignition in regard to absolute reliability and endurance.

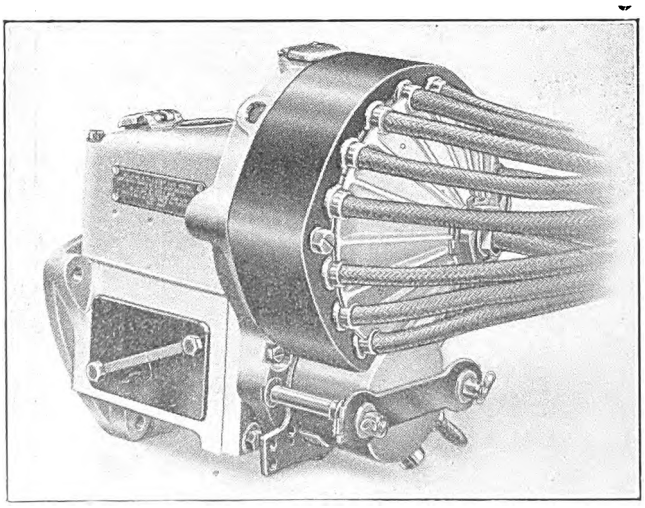
These magnetos have a "straight through" steel shaft on which the rotating inductors are mounted.

As there are four sparks per revolution of the shaft, the magneto operates at half the speed at which a rotating armature type of magneto (suitable for a corresponding number of cylinders) is driven and this ensures long life of the various moving parts. The low speed sparking characteristics of the magneto are extraordinarily good.

A special type of distributor is provided which operates with a small spark gap between the rotating metal brush and the segments. With distributors of this design, distributor tracking troubles are avoided, and, consequently, it is only necessary to clean the distributor track very infrequently.

Nickel is used for the distributor segments and distributing electrode, as it has been proved by experience that this metal has longer life and greater freedom from pitting than others.

The entire iron circuit, in which the flux reversal occurs, is laminated, which thus gives a very rapid rise of voltage at "break" and results in increased intensity of the spark.



The B.T.H. SC-14 magneto.

Both the type SC-7 and SC-14 magneto have an oil-tight gland in the driving end-plate, which prevents oil under pressure in the crank-case from being forced into the interior of the magneto. Both types can be arranged with or without shields for the contact breaker and distributor.

On the Mongoose, Lynx, and Lynx-Major engines the type SC-7 magneto is driven at 7/8 engine speed, and on the larger Jaguar, Jaguar-Major and Leopard engines the type SC-14 magneto is driven at 1¾ engine speed.

PISTON-RINGS.

The foreword to a booklet recently published by the British Piston Ring Co., Ltd. states that "Half the secret of the success of a piston-ring consists of making it of the right material."

After years of experience this company has not only solved the problem of producing the right material, but has also perfected the design and manufacture of the piston-ring to an extremely high standard.

"Brico" piston rings are made from cast iron which is cast centrifugally, that is, the molten metal under the action of centrifugal force is thrown to the surface of a metal mould which is rotated at high speed. This produces a much finer grain material than that which is obtained with ordinary sand castings.

To attempt to describe, even briefly, any more about the manufacture of these rings is very much outside the scope of this note, but it is hoped that this may be done at a later date.

In the meantime it is safe to say that the piston-ring has kept pace with the great improvements made in aero-engineering in recent years. Credit for this development is due to several manufacturers one of whom is undoubtedly the British Piston Ring Co. Ltd., of Holbrook Lane, Coventry.

A copy of their booklet entitled "Piston Ring Cast Iron and Design" will be gladly sent to all interested persons, and the company extends an invitation to all aero-engine manufacturers to visit their works and there investigate any problems concerned with aero-engine piston-ring design.

"TITANINE" DOPING FINISHES.

The doping finish which Sir W. G. Armstrong Whitworth Aircraft Ltd. have always used on aeroplanes manufactured by them is made possible by the application of "Titanine" Dopes, Varnishes and Lacquers.

Of the many outstanding qualities of these materials, durability and tautness under all climatic conditions predominate. These qualities naturally appeal to pilots who have to fly in all weathers, but in a still greater way do they appeal to aircraft constructors who are anxious to obtain the best results on aircraft which they manufacture, both at the time of production and after the machines have been subjected to the stresses and strains of use. Discriminating manufacturers such as Sir W. G. Armstrong Whitworth Aircraft Ltd. use "Titanine" to ensure that they obtain the best possible results in doping finishes.

"Titanine" materials have been used for over 10 years by Sir W. G. Armstrong Whitworth Aircraft Ltd. and also are used on the majority of aircraft constructed in this country. "Titanine" is also used on a vast number of machines constructed on the Continent and in the United States, Canada and elsewhere, which testifies to the claim of the manufacturers that it is the World's Premier Dope.

"Titanine" doping materials can be supplied in distinctive colour schemes to suit customers' requirements. Particulars of various schemes can be obtained on application to the manufacturers and sole proprietors, Titanine-Emaillite Ltd., Head Office, Empire House, 175, Piccadilly, London, W.1.

SMITH'S AIRCRAFT INSTRUMENTS.

As with so many types of aircraft, Smith's Aircraft Instruments are standardised on the Armstrong Whitworth Argosy, a fleet of which are in successful use on the Continental air routes of Imperial Airways Ltd.

The full range of instruments includes the "Husun" compass, for which Smith's Aircraft Instruments are sole selling agents. And thereby hangs a tale. About a year ago a certain aircraft set off from A to fly to B a quarter of an hour after another aircraft of identical performance had started the same journey. The first machine arrived at B a quarter of an hour before the other machine. Moralising, the pilot explained that this was due to his accurate compass, supplied by Smith's, which enabled him to steer a perfect course.

Smith's Aircraft Instruments are also sole export distributors for the famous K.L.G. sparking plugs, which plugs are fitted as standard to all Armstrong Siddeley aero-engines.

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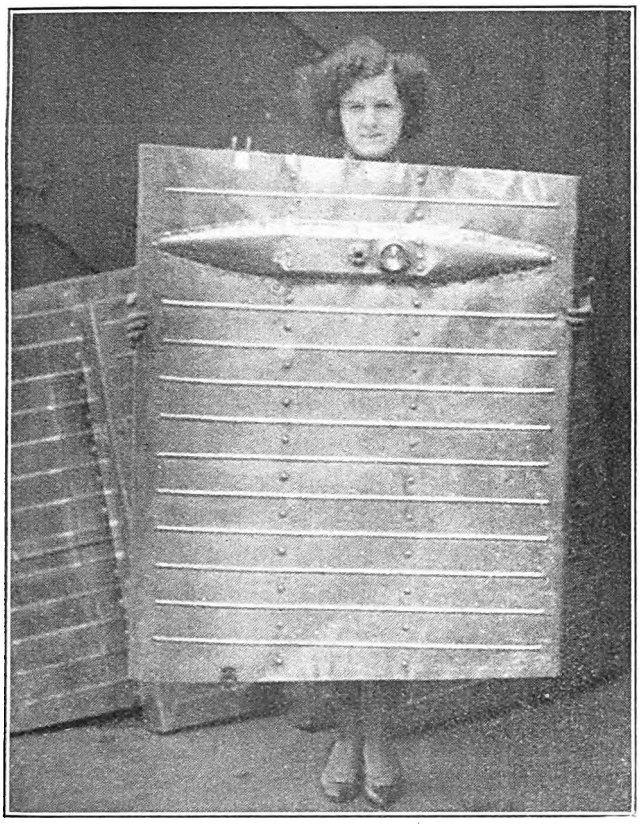

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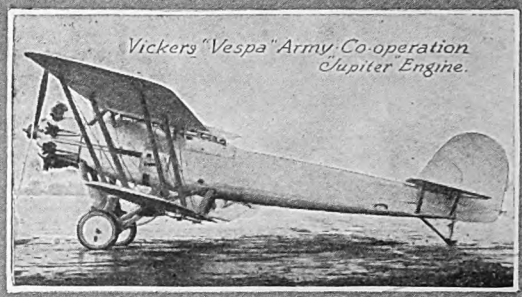
Vickers "Type 143" Single Seater Fighter.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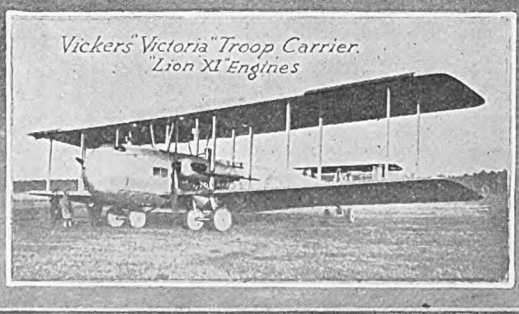
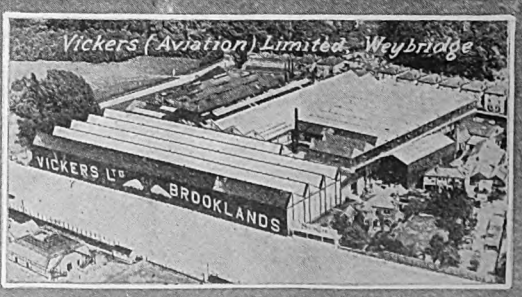

Vickers "Victoria" Troop Carrier. "Lion XI" Engines



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THE LIGHT AEROPLANE
AND THE FLYING CLUBS.

THE HOUSEHOLD BRIGADE PARTY.

On Saturday, June 21, the Heston Air Park gave another of those delightful afternoon parties which it does in a way which is quite its own. The actual givers of the party were the Household Brigade Flying Club, and the occasion was the Competition by Members of the Club for the Gwynn Maddocks Cup, which was presented to the Club by the parents of the late Mr. Gwynn Maddocks of the Coldstream Guards who was killed at Brooklands two years ago.

The winner of the competition was Mr. A. V. C. Douglas, Scots Guards, with Mr. J. K. Mathew, Irish Guards, second, and Mr. Raymond Quilter, formerly Grenadier Guards, third. Mrs. Alan Butler, Mrs. Vereker, and Mrs. Cleaver also competed, as wives of officers or retired officers of Guards regiments. Taking it all round the handling of the machines was extraordinarily good.

The cup was presented to Mr. Douglas by Maj.-Gen. C. F. Corkran, C.B., C.M.G.

The second event was a demonstration of the Desoutter by Mr. H. M. Schofield of National Flying Services Ltd., who put up his usual neat and convincing performance.

Following this came an exhibition of aerobatics in formation by three Gamecocks (Jupiter) of No. 23 (Fighter) Squadron from Kenley. The pilots were Flt. Lt. R. L. R. Atcherley, Flg. Off. Duncan S. MacDougall, and Sgt. White. There may be more perfect formations in the R.A.F., but if there are they must be hard pressed to prove their claims to superiority. The formation did all those things which have ever been done in the way of formation aerobatics, including keeping the most perfect formation while looping.

The next event was an exhibition by Mr. L. S. Snaith in a Comper Swift (A.B.C. Scorpion). Owing to a slight mishap with the cap of his petrol-tank Mr. Snaith's style was rather cramped, and he was unable to fly upside down as much or as low as usual,—which formed the basis of an elaborate and ingenious story by a brother officer.

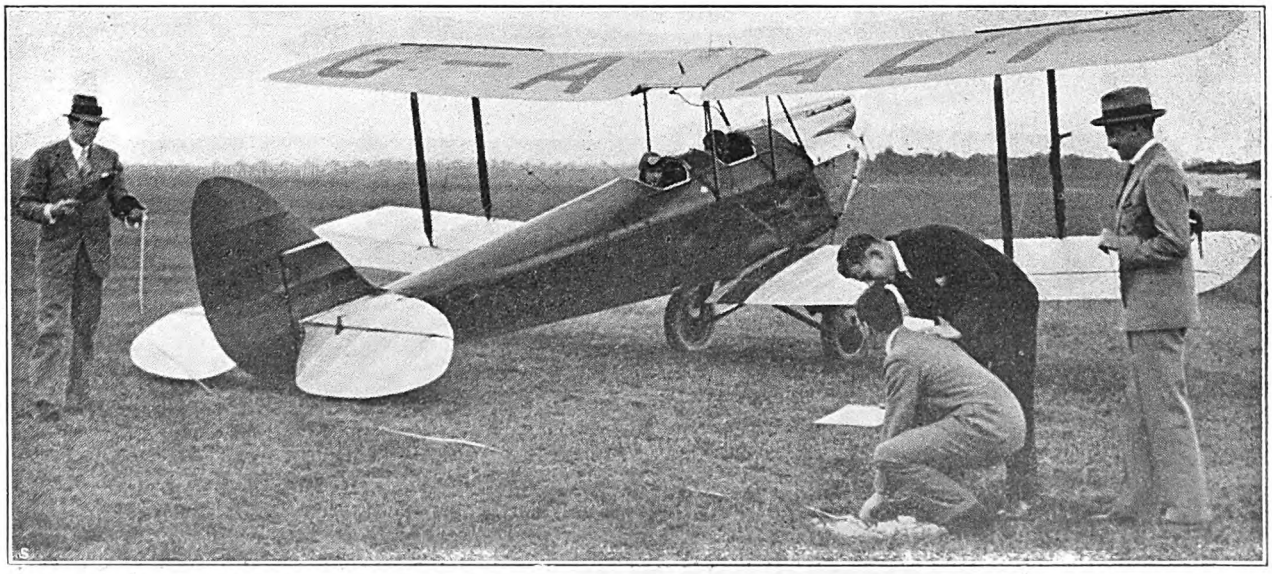
Said he, in effect, "There has been a lot of trouble about this low flying lately. Somebody removed the hat of the Director of Civil Aviation with his tail-skid the other day, so low flying is unpopular. In fact the authorities have a lot of plain-clothes men down here to-day watching for somebody to fly low so that they can make an example of him. And you see the result. There's Snaith, who generally can't be seen when the grass is long, flying so high that you can't see him anyhow,—and there are some of the plain-clothes men watching him,"—he ended, nodding his head towards a party which included a couple of perfectly respectable Group Captains and a Wing Commander or two, who were thoroughly enjoying a peaceful afternoon party.

Thereafter came an excellent display of individual aerobatics in Gamecocks by Flg. Off. D. S. McDougall and Flg. Off. F. X. McKenna.

Then Flg. Off. J. G. D. Armour proceeded to some crazy flying in a Moth, followed by Flt. Lt. G. H. Stainforth who flew upside down and did inverted falling leafs and things in the Junkers Junior (Genet engine).

VICTOR LUDORUM.—Major-General C. E. Corkran presenting the Gwynn Maddocks Cup to Mr. Douglas of the Household Brigade Flying Club.
("Aeroplane" photograph.)

The party was ended by Mr. Raymond Quilter doing a sensational parachute drop from a Puss Moth piloted by Mr. Lawrence Hope. Mr. Hope, who has had quite an amount of experience of this sort of thing, manœuvred for a nice position up-wind from which a parachute should drift well into the aerodrome. Mr. Quilter, who was making his first parachute drop and had decided in his own mind to do a delayed drop, dropped what looked like about half



AN INNER.—Measuring the score of a Household Brigade competitor for the Gwynn Maddocks Cup at Heston. Little tape was needed for this one.

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the distance between the machine and the ground before pulling the string. The result was that he came down several hundred yards short of the aerodrome. At the time it rather looked as if he had fallen into the Car Park, which would probably have been bad for him and probably for a car or two as well,—for a heavy man dropping at parachute speed would go through the roof of any car on which he fell, and might, with lee-way, conceivably damage the roof of one and the side of another, besides himself.

After this event there was a good deal of interesting flying and a number of important people were taken up in the Puss Moth, which seems likely to be one of the most popular aeroplanes in the World. The Gamecock formation departed in exquisite formation and everybody went home pleased.

Somewhat naturally one would expect the Household Brigade Flying Club to get together a good-looking crowd, but even so there is a good deal of satisfaction in finding that the right people are beginning to take a lively interest in flying.—C. G. G.

THE REDWING.

There was a pleasant ceremony at Croydon Aerodrome when the Redwing was formally baptised by Sir Sefton Brancker on Thursday last. Referring to the slow landing and general handiness of the machine, Sir Sefton remarked that it was what was wanted to-day, i.e., an old gentleman's aeroplane. He referred to himself as an old gentleman who is fond of flying, but all we have to say is that if the Air Vice-Marshal was any younger in spirit when he was 21 than he is now he must have taken a bit of holding in those days. In the bottom right-hand corner of the Robinson Aircraft Company Ltd. invitations to the ceremony was a small notice which was highly appreciated after the actual baptism—these were partaken of in the Aerodrome Hotel, and Mr. Robinson is to be congratulated not only upon his excellent aeroplane, but also upon his charming hospitality.—SPRY.

YE HALDON RALLYE.

Considering the state of the weather, which, in so far as the Haldon Aerodrome, near Teignmouth, Devon, was concerned, consisted of low clouds and fairly high winds, the Rallye, held on Saturday last, was a huge success, which the organisers, Mr. Parkhouse and Capt. Lamplugh, thoroughly deserved, as their last effort in this direction was a complete fiasco owing to the most appalling weather conditions.

While handing the organisers a laurel crown, one would like to give them a gentle jolt concerning the state of the aerodrome surface. The huge and fearsome clouds of dust, raised by machines taxying, were a continual nuisance to the spectators in the southern and eastern enclosures. Pilots and mechanics also suffered. In fact a certain West-Country pilot arrived a handsome fair-haired Saxon and departed a filthy specimen of a Dago.

Having unloaded this trifling grievance, one will now proceed to the business of the day. At 11.00 hrs. the first machines entered in the Teignmouth Air Trophy Competition arrived. In this event, which is a variant of the usual arrival competition, the entrants were required to declare their point and time of departure, together with an estimate of their speed. On arrival the difference between their actual speed and declared speed was found. The distance covered was then divided by this difference, and the entrant obtaining the lowest figure from this abstruse mathematical calculation was declared the winner.

Mr. P. A. Wills, in a Cirrus Moth, flying from Heston, put up the winning performance. His figures are as follows,—Declared Speed 65 m.p.h., Actual Speed 64.79 m.p.h., with resulting figure of .21. Second place went to Mr A. H. Downes-Shaw, and Mr. A. C. M. Jackaman had to be content with third place. There were 14 competitors.

At 13.30 hrs. Mr. S. A. Thorn took the air in his Hermes-Avian, and gave a very stylish aerobatic display, his inverted flying and quick rolls were particularly pleasing. Mr. Thorn is also to be congratulated on the way in which he brought his machine in through a crowd of arrivals, after his engine had accidentally cut out, shortly after his display.

About this time there was a fly-past of a specimen of each type of light aircraft present. The Desoutter was flown with pilot, two passengers and baggage, and the Puss-Moth was demonstrated solo. Surely if machines are to be shown off to the best advantage they should carry designed loads or at any rate equivalent loads.

The three Bristol Bulldogs from No. 17 (Fighter) Squadron, piloted by Flg. Off. Saville, Plt. Off. Cole and Plt. Off. Watt, put up a very good show, despite the low clouds and general bumpiness, which usually interfere with combined aerobatics in close formation. A fourth Bulldog, piloted by Wing Cdr. Reid, A.F.C., O/C. No. 17 (Fighter) Squadron, was also present.

A GOOD VIEW.—The pilot's seat in the Desoutter Mark II, in flying position, showing the fine view all round.—(*"Aeroplane" photograph.*)

THE DESOUTTER MARK II.—The latest type is seen here with inverted Gipsy III engine, new type rudder and fin and lower undercarriage. It also has improved visibility and performance as described on June 18.
—(*"Aeroplane" photograph.*)

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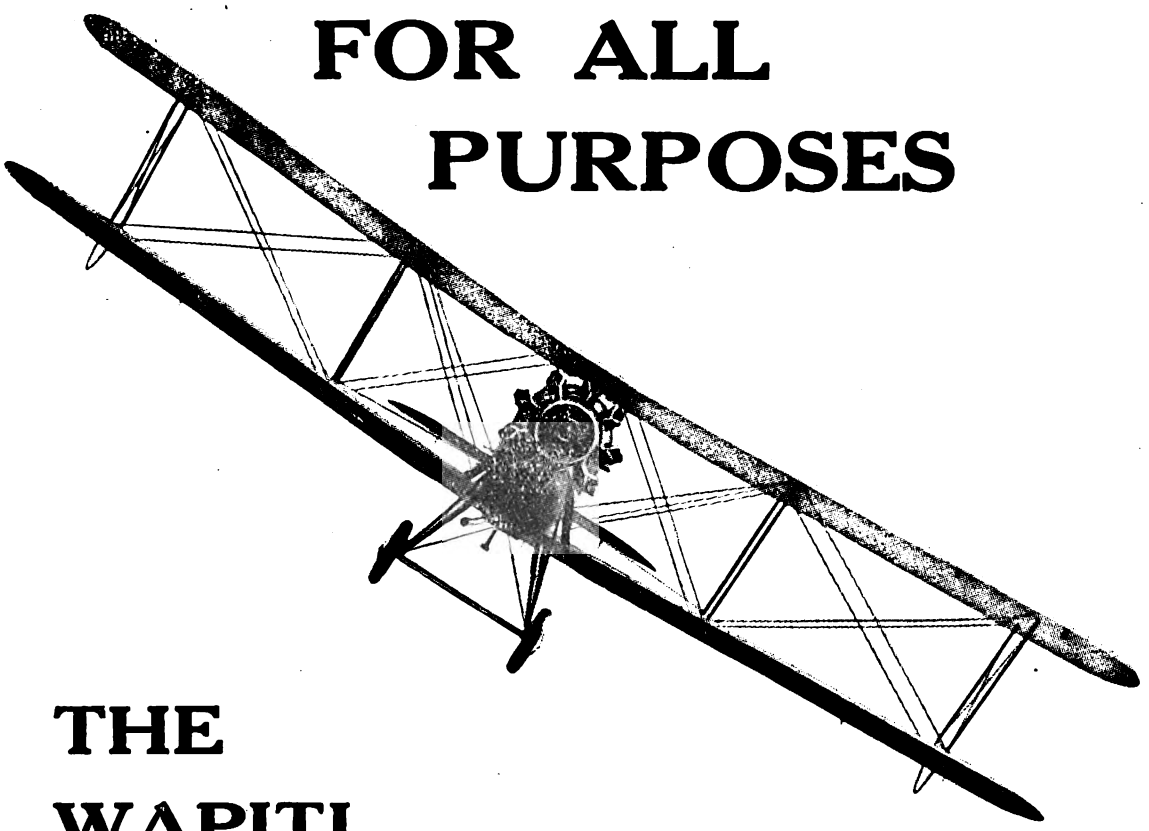

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The next item was a Challenge Race between private owners. This was a particularly stout effort on the part of the handicapper, Capt. A. G. Lamplugh. Six machines took part, and the result was a dead-heat between Mr. Thorn, in a Hermes-Avian, and Mr. A. C. M. Jackaman, in a Coupé Moth, with the rest of the competitors in a bunch right on their rudders. An exceedingly close finish, which delighted the crowd immensely.

While this race was in progress Mr. H. S. Broad gave one of his usual faultless aerobatic shows in a Gipsy-Moth. He later won the Balloon Bursting Competition by bursting the only balloon caught with a thrilling zoom in a Puss-Moth.

Then followed in rapid succession a demonstration of the Autogiro by Mr. Rawson, a crazy flying show by Flt. Lt. T. Rose, A.F.C., in a Moth, and aerobatics in a Desoutter by Mr. Schofield.

The Parachute Descent by Mr. John Tranum and the Haldon Map Reading Competition were postponed owing to weather conditions, but one understands that these events were successfully staged on the following day, Sunday.

The prizes were presented by Mrs. G. S. Young, wife of the Chairman of Teignmouth Council.

Altogether there were 44 machines present, made up as follows: 17 Gipsy Moths, 5 Cirrus Moths, 3 Coupé Moths, 2 Puss Moths, 4 Bristol Bulldogs, 2 Hermes Desoutters, 2 Hermes Avians, 2 Cirrus Avians, 2 Cirrus Widgeons, 1 Cierva Autogiro (Genet Major), 1 Westland Woodpigeon, 1 Salmson Klemm, and 2 joy-ride Avros.

It will be noted that the genus Moth numbered 27, so that it may well have been advertised as a Mothers' Meeting.

Among the machines was to be noted the ancient and one and only Westland Woodpigeon, whose owner-pilot, Flg. Off. Scroggs, was greeted with many rude and coarse remarks, after flying very sedately from Northolt. This aeroplane, or whatever it was called on Saturday, is now nearly 10 years old, and despite its decrepit appearance, its flying qualities are still a credit to its constructors.—A. H. L.

AN UNHERALDED DEPARTURE.

On June 20 Mr. James Mathews and Mr. E. L. Hook left Lympne in a Gipsy Moth, G-AAWV, for the Continent and reached Lyon, where they spent the night. The next morning they went on to Marseilles and left for Rome later on Saturday. Their destination is reported to be Australia.

Mr. Mathews was formerly employed by Mr. Bert Hinkler.

The pair spent Saturday night at Pisa and left again on Sunday for Naples and Catania without landing in Rome.

ACQUITTED.

A charge of low and dangerous flying brought against Mr. F. G. Miles, managing director of Southern Aircraft Ltd., at Hove, has received some publicity of late. Mr. Miles was accused, by Miss Florence Milne, of Hove, of flying over the heads of bathers "too low to give anyone a chance of being saved if there had been an accident,"—whatever that may mean. Mr. Miles stated that he was never less than 200 ft. above the water. The case was dismissed.

GOOD BUSINESS.

On June 5 Mr. Kroller, of London, flew to Barrow to interview a business colleague on a matter of importance to do with shipping. He arrived at 09.15 hours, and the second party to the conference immediately decided to go to Holland as a result. A second air taxi of National Flying Services was got from Leeds and flew him to Harwich in time for the boat, what time Mr. Kroller flew back to work in London.

AN ISLAND DEBUT.

The Islanders of Wight were treated to their first "Aerial Pageant" on home grounds on June 12, when the Isle of Wight Flying Club was formally inaugurated at Shanklin Aerodrome. Visiting pilots of such name and note as Flt. Lt. Rose, Messrs. Neville Stack, R. R. Bentley and George Murray, besides others, gave exhibitions of flying.

The Club is operated under the proprietorship of Wight Aviation Limited, who organised the Pageant. Considering that it clashed with several other rather important events on the Island, the attendance was good, and perfect weather followed an unpromising morning. The opening ceremony was performed by Sir Alliott V. Roe.

Ten aircraft took part in the parade, including Klemm (Salmson), Spartan (Cirrus III), Blackburn Bluebird (Gipsy), Moth (Gipsy), Avian (Hermes), and Moth (Hermes). Among the pilots present, besides those already mentioned, were Lt.-Col. L. A. Strange, Messrs. Thorn, Rogers, Brown, Ash, Windsor, Allen, Cliff, and Woodward.

Lubrication trouble brought Flt. Lt. Rose down shortly after he had taken off with Mr. Tranum for the parachute event. Col. Strange took up his duties,—and Mr. Tranum, who performed with his usual aplomb. Mr. Thorn won the aerobatics competition against Mr. George Murray, Mr. Bentley did some crazy flying on the original Moth of his South African flights, and later won a bombing competition. Mr. E. C. Brown won the balloon-bursting, and finally Mrs. Bentley presented the prizes.

Spectators are unanimous on the quality of the flying, but they concur in hoping that the management of the enclosures will be better done on the next occasion. The chaotic method of admission gave the function an air of the popular amusement park rather than the dignity of an inauguration. Such an event should certainly be so ordered as to add prestige to the new Club and its members.

FROM BROOKLANDS.

The total flying hours of the School during the month of May amounted to 190. During this period Messrs. Ruutz-Rees and Ogilvie-Forbes completed all tests for their "B" licences, also the following pupils have qualified for their "A" licences—Messrs. Bowles, Oliver, Stewart, Moncrieff, Wright, Taylor, Wickstead.

The Whitsun Holidays found the School joy-riding at Brooklands, Northampton, Clacton and Runnymede.

Commander Leathes and Mr. Bharucha, who flew off to Kenya in the former's Moth during April, had the misfortune, after nearly completing the journey, of having their machine partially damaged by fire started by a hostile tribe while they were lunching at a stopping place en route. We understand it was a case of mistaken identity.

THE LATEST AVRO.—The Avian Monoplane (Genet-Major).

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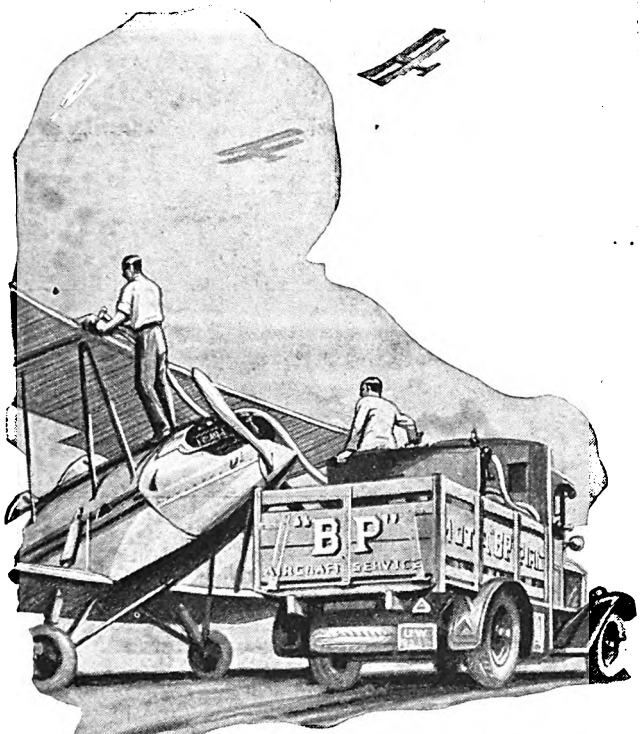

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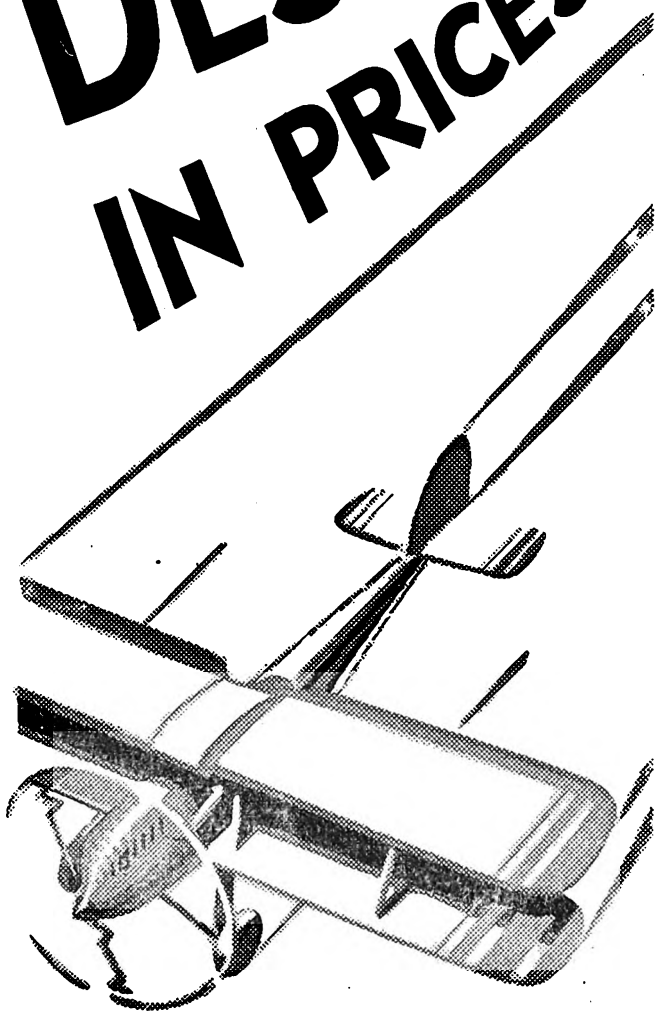

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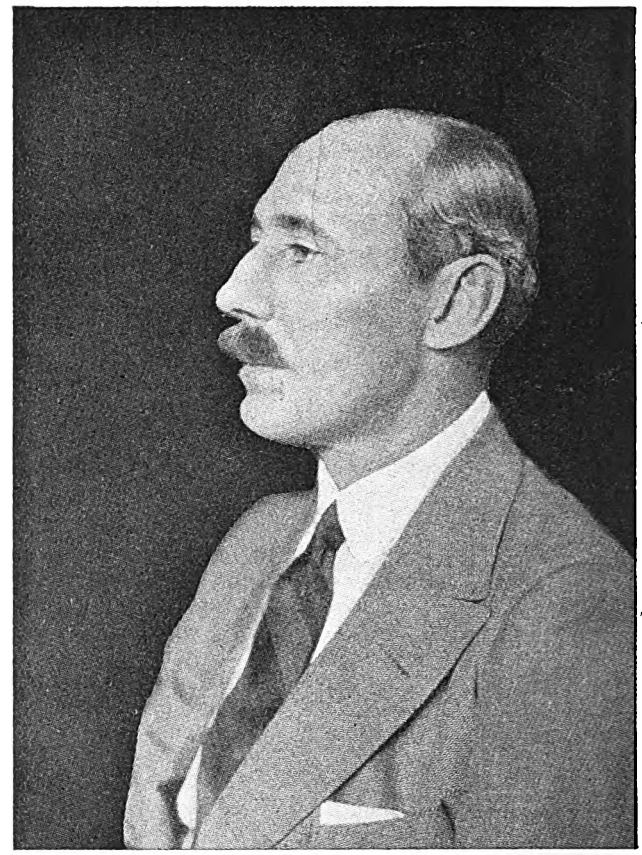

CAPT. THE RT. HON. F. E. GUEST, P.C., D.S.O.

Chairman of the National Flying Services, Ltd.

For every man and woman who flies to-day, thousands will do so when better facilities exist—for every aerodrome and landing ground now available for private fliers, scores will spring into being when the need for them is recognised. This, in a few words, explains the origin and points to the objects of National Flying Services, Ltd. The aim of the Company is to organise a system of national flying facilities that will make air travel the most pleasant and convenient, as well as the fastest method of locomotion. Their service includes all aviation activities—air taxi services, commercial flying of all kinds, garaging and servicing organisation for aircraft and flying tuition.

Realising that efficient lubrication of aircraft engines is of vital importance, National Flying Services, Ltd., use Duckham's Adcol N.P.5. on their own machines—a striking tribute to this New Process Oil which is stocked at all N.F.S. air parks and landing grounds. Adcol N.P.5. surpasses the Air Ministry's specification D.T.D. 109. P.4—the most exacting test in the world. Duckham's Adcol for Better Lubrication,

Advertisement of Alexander Duckham & Co., Ltd., 6, Broad St. Place, London, E.C.2.

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COMMERCIAL AERONAUTICS.

THE NEW VICKERS COMMERCIAL MONOPLANE FOR AUSTRALIA.

West Australian Airways Ltd., of Perth, W.A., have ordered from Vickers (Aviation) Ltd. two Vickers Viastra 14-seater all-metal monoplanes, each with two 480 h.p. geared Bristol Jupiter XI F engines.

These machines are due for delivery in November and they will be immediately put into service on the new Adelaide-Sydney extension of the Trans-Continental Perth-Adelaide route, which has been operated with conspicuous success by West Australian Airways for just a year.

Apparently the chief reason for introducing new machines after such a short period (as compared with Imperial Airways which keep on with old types for many years) is that the strong winds in the South of the Australian Continent make high speed imperative if the air mail is to beat the railway.

The new extension will connect with the Trans-Continental, and passengers and European mails which will leave Perth on Tuesday mornings will arrive in Sydney at 09.30 hrs. on Thursday mornings.

The company will erect and maintain at Hay a hostel similar to that at Forrest, W.A., on the Trans-Continental route, for overnight accommodation.

The Vickers monoplane has been developed by Vickers (Aviation) Ltd. to give the commercial aircraft operator a cheap, fast and reliable aeroplane. It is adaptable to various engine installations with either one, two or three engines and it can also be supplied with either land undercarriage or floats.

A brief description of this machine appeared in THE AEROPLANE for April 30 but for those who missed this description the main features will be repeated.

The Viastra is a high-wing monoplane of all-metal construction, including the covering. The fuselage has accommodation for two pilots seated side-by-side forward of the wing in an enclosed cockpit and aft of this cockpit and below the wing is the cabin, which seats twelve passengers.

The cabin has double walls between which is placed a special sound-resisting stuffing. A special ventilating system allows for fixed windows and a further reduction of noise. Exhaust-heated or electrically-heated air is provided.

Aft of the cabin is a lavatory and there are two baggage compartments one forward and one aft of a total capacity of 100 cub. feet. The capacity of the cabin and lavatory is 640 cub. feet.

Should the machine be wanted for freight-carrying purposes the passenger seats, which are quickly detachable, may be removed.

The undercarriage is of the divided type with a very wide track. The wheels are fitted with Vickers patent hydraulically operated wheel brakes, and there is a castoring tail-wheel with oleo springing.

The power plant may consist of one Bristol Jupiter, two Armstrong Siddeley Jaguars, Jaguar-Majors, or Bristol Jupiters, or three Armstrong Siddeley Lynxes, Lynx-Majors or Mongooses, but any other engines of similar power may be fitted.

With the two Jupiter engines Vickers (Aviation) Ltd. offer a guaranteed top speed of 160 m.p.h. and a cruising speed of 140 m.p.h.

The pay-load of the Viastra varies from 2,050 lbs. to 2,460 lbs., as a landplane, according to the power plant used.

AUGMENTATION.

To augment their fleet of D.H. Hercules biplanes for the Egypt-India section of the Imperial mail route, Imperial Airways Ltd. have bought, second hand, one of the Hercules belonging to West Australian Airways.

THE INAUGURATION AT NOTTINGHAM.

On June 19 Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, opened the new Municipal Aerodrome of Nottingham at Tollerton. The site was developed by and the aerodrome leased to National Flying Services. It is the fifth aerodrome established by the organisation.

Sir Sefton said, when he opened it, that the aerodrome must be recognised as a national asset, for the unity of the Commonwealth of Nations was largely dependent on the British becoming the airmen of the world as they had been the seamen of the world.

The Lord Mayor of Nottingham, Councillor W. Wesson, was present at the opening, accompanied by several civic officers, and they looked on with a crowd of 5,000 people at exhibition flying and races.

A race over a course of 30 miles was won in a Spartan by Mr. H. Andrews, of Southampton, at an average speed of 98 m.p.h. Mr. H. M. Schofield gave a display of crazy flying on a Moth, and a parade of aircraft showed the spectators a good variety of types. Among them was Mr. Egglesfield with the Autogiro,—the first time this machine has been seen in public for some while, despite several advertised appearances.

ANOTHER LITTLE STEP.

The provision of special boxes for air mail only is now an accomplished fact at a limited number of points in the London area. Letters posted in these boxes will have the advantage of special collection in time for dispatch by the earliest aeroplane available for their destination, and should be stamped with the proper surcharge and either marked prominently "Air Mail" or labelled with the official blue sticker.

Letters not marked for transit by air, or not prepaid with the air mail fee, will be delayed if posted in the special air mail boxes.

These have been erected on the following sites:—

King Edward Street, E.C.1 (outside G.P.O.); outside Ludgate Circus branch post office, E.C.4; Moorgate, E.C.2 (opposite Britannic House); front of Royal Exchange, E.C.3; outside W.C. district post office, High Holborn, W.C.; High Holborn, W.C. (south side, opposite Staple Inn Buildings); East Strand, W.C. (near Surrey Street); outside Charing Cross branch post office, W.C.; Oxford Street, W.1 (N.E. side); Piccadilly Circus, W.1 (opposite Pavilion Theatre); Victoria Station, S.W.1 (entrance to forecourt).

Additional boxes will be provided shortly at:—

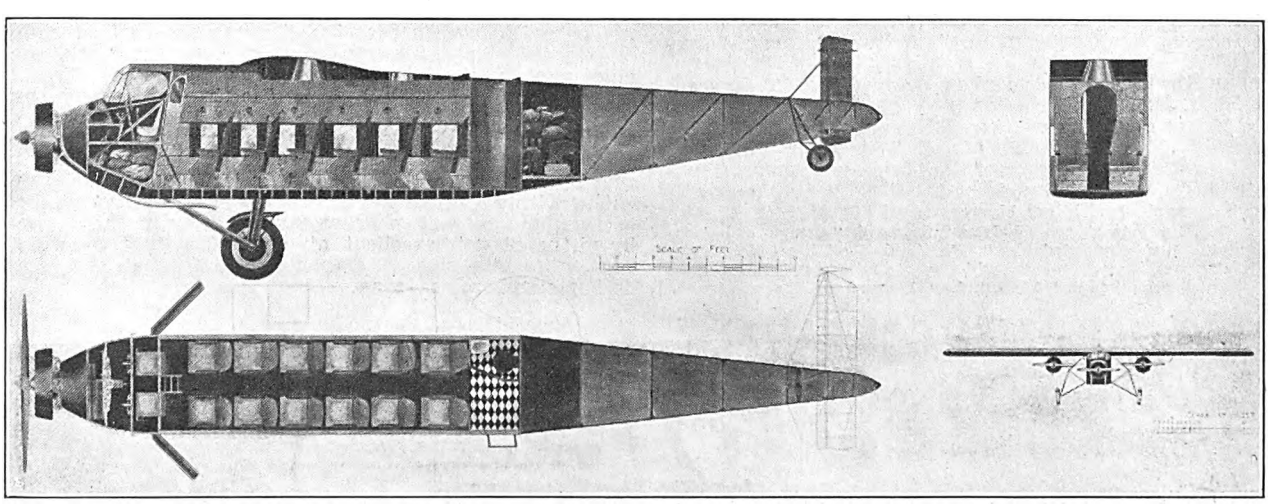
Charles Street, Haymarket, S.W.1 (front of Imperial Airways offices); outside Parliament Street branch post office, S.W.1.

THE VOYAGE TO AUSTRALIA.

The following letter has been received:—

Sir,—With reference to the letter from the Desoutter Aircraft Company in the last issue of THE AEROPLANE, we are happy to be in a position to confirm the statement made by our friends, The Desoutter Aircraft Co. Ltd., to the effect that Messrs Piper and Kay, during the whole of their flight from England to Australia, experienced no trouble whatsoever with their machine.

(Signed) CIRRUS AERO-ENGINES, LTD.



THE PASSENGER-CARRIER.—Side view, plan, section, end elevation of the Vickers Viastra.

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A TALE OF THREE CITIES.—PART II.

In announcing last week the inauguration of the new Imperial Airways service (to connect the North and Midland with the Continent) by a flight from Croydon to Birmingham, Manchester and Liverpool, THE AEROPLANE was somewhat sanguine. Owing to a very bad weather report from Liverpool the scheduled flight was abandoned at Manchester.

The pilot had never previously been to Speke Aerodrome, Liverpool, which has no markings whereby it may be recognised, especially in the evening with a Mersey mist in attendance. Visibility was reported to be about 300 yards, which is common enough thereabouts at other seasons, but is a pretty good summer effort even for the Mersey.

The Lord Mayor of Birmingham, who had flown with the liner from Croydon, and his Lady Mayoress, who joined the Argosy at Birmingham, were obliged to stay the night at Manchester, instead of making their projected—and expected—visit to Liverpool. And so did a pleasingly anticipatory reporter of *The Liverpool Echo*, who flew to Paris on the outward service the day before.

A NEW LEASE OF THE STONE AGE.

To invite the custodians of our roads to aerodromes, and there to exhibit to them assorted samples of granite chips and assorted road stones, has all the earmarks of a Machiavellian stroke. Verily the stone merchants of Leicestershire believe in heaping coals of fire on Newcastle, and furthermore, in suspending a sword of Damocles, in the form of the road-free aeroplane, over the heads of those who should be making roads fit for others than heroes to travel.

The inference is that, without swift and profuse application of Leicestershire granite chips, the roads will shortly be practically deserted expanses of bumps and hollows underneath populous highways of the air, which would be bad for quarries and highway experts alike.

The fact that granite had never before been transported by air in the history of aviation was not the point to emphasise about the exploit of the Associated Leicestershire Quarries Ltd. and their collaborators on Friday, June 20. The first of anything is not necessarily as significant as the beginning of a policy, and continuity counts for more than priority.

Two aeroplanes, both owned by Mr. W. Lindsay Everard, M.P., president of the Leicestershire Aero Club, were used to carry neat sample cases of granite road-metal from Desford, Leicestershire, round a circuit of Grantham, Northampton, Heston, Cambridge, Stag Lane and back to Desford the same day. Mr. Everard's new Puss Moth, G-AAXM, was piloted by Mr. F. H. Stewart David and carried Mr. C. F. K. Smith, Commercial Manager of the Bardon Hill Quarries; and the Gipsy Moth, G-AAUH, was piloted by Mr. C. E. Hurst and carried Captain W. G. Hurt. All four are members of the Leicestershire Aero Club.

Mr. Everard is a true sportsman, as evidenced by the names of his air stable, UH is called *The Foxhound*, and XM the *Leicestershire Fox*, and further proved by the fact that, as Sir Sefton Brancker pointed out, the latter is a great deal faster than the former.

The Leicester and County Chamber of Commerce also helped to organise this demonstration.

The aeroplanes left Desford at the fashionable business hour of 10.30 and XM flew to Grantham, left samples and set off for Heston which was reached soon after 12.30 against a head wind. UH had meanwhile visited Sywell and arrived at Heston with the other after a rendezvous at Stag Lane.

At Heston the aviators enjoyed a really sumptuous lunch as guests of the Associated Leicestershire Quarries, with Capt. C. H. Martin, of that firm, in the chair. Among those who were there to cheer them in and share the lunch were Lord Ponsonby, Parliamentary Secretary of the Ministry of Transport; Mr. F. Montague, M.P., Under-Secretary of State for Air; Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation; Col. C. H. Bressy, C.B.E., Chief Engineer of the Roads Department, Ministry of Transport; Capt. H. H. Balfour, M.P., Secretary of the Air Committee of the House of Commons; Mr. W. Lindsay Everard, M.P., Capt. A. C. N. Dixey, M.P., Mr. E. Winterton, M.P., Mr. A. Dryland, County Surveyor of the Middlesex County Council, Mr. J. G. Carey, Surveyor of the Heston and Isleworth District Council, Mr. Nigel Norman and Mr. F. A. I. Muntz.

After the Royal toast the Chairman proposed "Commercial Aviation and the Road-stone Industry." He thanked all his collaborators in this, the first trial of salesmanship by air in the granite business at least, and complimented Mr. Lindsay Everard on his sportsmanship and public spirit. Many people, he said, thought that Leicestershire occupied itself with little more serious than fox hunting, but in the western part of the county they did quite a little quarrying, in fact rather more than any other English county.

LORD PONSONBY said that the road-stone industry was not faced by foreign competition as seriously as some others, but it was good to see yet another example of British enterprise breaking through British indolence, waking up, and doing things rather faster and better than anyone else did them.

MR. MONTAGUE complimented those who had conceived and organised the trial of high-speed salesmanship.

SIR SEFTON BRANCKER remarked that extremes constantly meet and the unexpected happens. He had often imagined Paris creations, caviare, and other light but costly commodities, being sent by air, but his wildest dreams had never contemplated granite. However, fox hunting was a good education, as witness the sporting instinct which named one aeroplane *Foxhound*, and a much faster one *Leicestershire Fox*. In many ways England lagged behind the world, partly because there was little incentive to fly within England where train and motor services were good; but within the Empire, there was every incentive. Private enterprise, too, was capable of rising above mere incentive, as witness Messrs. Norman and Muntz, who founded the best and most flourishing Air Port in the country without any help whatsoever

MR. DRYLAND proposed the health of the Chairman.

THE CHAIRMAN thanked the company, and announced that services were gradually growing up which made business by air more and more practicable. For instance, the A.A. message service. As an example, some time before the aeroplanes arrived at Heston he got a message from the A.A. patrol box at Rockingham which had been dropped there from XM after it had visited Grantham. It read:

"Samples received and approved. Congratulate Associated Leicestershire Quarry Owners on their enterprise in being the first in Great Britain to send representatives of granite by air. Signed: W. B. Puiser, County Surveyor, Kesteven County Council."

The machines took off at 14.30 hours for Stag Lane and Cambridge respectively, where they had appointments with other road-men.

MANY INVENTIONS.

To dine at 7.30 provincial, quotha! ? Eh, Sirs! the gentleman doth bite his thumb at us in this matter—he doth indeed. Now, by the holy bowler hat of Sanct Botargo of Bologna, we will dine, aye and wine withal, at the crack of dawn rather than subscribe to the slavish conventions of Clapham in such matters. What? Shall a man be crammed into a parboiled shirt at 8.30 p.m. to masticate cold mutton because, forsooth, it is so ordained in the Balham Book of Hours—A truce to such mumchance mockery, say we!

Mr. Jack Mathews and Mr. Hook who set off by stealth from Lympne on Friday morning at 04.30 to fly non-stop to Marseilles in a Moth named *Dryasel* gave their friends a lot of unnecessary anxiety because they were not heard of till Saturday morning when they got to Marseilles.

Secrecy is all very well, and is in this case, we suspect, all part and parcel of the evasion of an I.P.A. owed us by the nimble Jack. But many of us began to fear the *Dryasel* had become wetasel in the ditch. Jack Mathews ought to have known better anyhow, and when he comes back after a record-breaking flight to Australia he should be compelled (as well as paying a fine of two I.P.A.s) to circumnavigate the British Isles in an ox-drawn tumbril, circling every village pub widdershins and anti-clockwise and reporting to the Ministry of Transport from every village post-office.

Lord Strickland, who recently flew from Marseilles to London by the Air Union daily service, was greatly delighted with his flight and asserted he would make a practice of using that service in future.

Walcott Air Lines Ltd. had a most successful week, and especially week-end, with their London-Le Touquet services. One passenger fell asleep on his first flight before leaving the French coast and had to be awakened when the machine drew up on the tarmac at Croydon. He had enjoyed his flight as a sleep, but was a trifle peeved to have missed it as a flight.

This firm operates from Eros House, Piccadilly, but it is not generally known that the site was chosen by the firm on account of the remarkable likeness of Mr. Clark, their chief pilot, to the late statue of Eros in Picadilly Circus.

Regarding this internal flying, the time will surely come when it will be quite possible to run Winter services between London and Liverpool, and anyhow if the provincial Liverpudlian can leave his native heath at 07.00 during the summer months each day and order his provincial tea (high, with relish) in the excessively provincial atmosphere of Hamburg he will make so much money in the summer by virtue of this excellent air connection that he will be content to hibernate at slow speed all through the winter in boats and trains.—SPRY.

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MOTHS IN CANADA.

The following is a copy of a cable which has been received by the De Havilland Aircraft Co. Ltd., from De Havilland Aircraft of Canada Ltd., testifying to the use being made of the fleet of Moth seaplanes operated by the Ontario Provincial Air Service:

During the season of great fire hazard Ontario Provincial Air Service is flying Gipsy-Moth seaplanes on forest patrol with amazing intensity and complete reliability stop from June first to seventh inclusive pilot George Delahaye from Twinlakes flew 61 hours 15 minutes 7 hours 30 minutes 6 hours 40 minutes 7 hours 15 minutes on machine CFAPB daily times being 7 hours 15 minutes 9 hours 5 minutes thirteen hours ten minutes ten hours twenty minutes establishing record for service stop pilot John Orne flew Moth GCAOZ from Orient Bay 57 hours 20 minutes during same period and nine other Gipsy-Moth flew 49 hours 39 hours 5 minutes 37 hours 45 minutes 34 hours 55 minutes 31 hours 40 minutes 29 hours 40 minutes 23 hours 45 minutes 23 hours 35 minutes 23 hours 35 minutes stop all these figures are typical of the regular work of the service.

A LUCKY MAN.

A curious accident befell Mr. J. H. Andrews last week. After winning the race at Nottingham he came over to Leicester and just when he was coming down to land a blade of his airscrew broke. The unbalanced blade set up such terrific forces that it fetched the engine clean out of the machine before he was able to switch off. Naturally the removal of the engine threw the machine completely out of balance, and it proceeded to come down in a kind of falling leaf, with all the controls in working order, but entirely ineffectual. Fortunately Mr. Andrews landed in a heap in such a way that he was not very seriously injured, though on Saturday he was still in a nursing home.

RELICS OF FAMOUS FLIERS.

An interesting series of Tabloid First-Aid Cases of historic interest associated with the names of men who made air history, including Vedrines, Cody, Grahame-White, Ovington, Picquet, Latham, Wellman, Turner, Blériot, Alcock, Ross-Smith, Hawker, Cobham and Byrd, is a feature of the Ideal Holidays Exhibition at present being held at the Royal Agricultural Hall, London.

The origin of this series of historic travel outfits dates from the early days of exploration, when Stanley undertook his daring journeys into darkest Africa. Practically every subsequent explorer of note, including Nansen, Scott, Stefansson, Shackleton, Mawson, Bruce and Amundsen followed the example of Stanley and provided themselves with "Tabloid" Equipments prepared by Burroughs Wellcome and Co.

THE BIG JUNKERS TRAVELS AFIELD.

The four-engined, 40-passenger Junkers monoplane, D 2000, flew from Dessau to Le Bourget early last week with a crew of seven and sixteen passengers. It made several demonstration flights at the Paris terminal airport.

ANOTHER TAXI DASH.

Journeys by taxi-plane are becoming very much in the day's work. On June 16 Lord Melchett was summoned to a business conference in Ostende from his home in Salisbury. He communicated with Imperial Airways, who sent a machine to bring him to Croydon for Customs formalities and then took him to Ostende in less than three hours from leaving Salisbury.

PARACHUTE ORDERS.

The Irvin Air Chute of Great Britain, Ltd., of Letchworth, Herts, has recently received orders for 300 parachutes from the Royal Air Force, for 200 parachutes from the Czechoslovak Government, and for a small quantity from the Irish Free State Air Corps.

A DESERVED APPOINTMENT.

Pursuant to the resolution of the Board of Petters Ltd., Capt. A. S. Keep, M.C., B.Sc., has been elected additional Director, the appointment dating from June 19. Capt. A. S. Keep has for many years been associated with the firm as Technical Superintendent of the Aircraft Department,—known officially as the Westland Aircraft Works.

PERSONAL NOTICES.

BIRTHS.

LEASK.—On May 2, 1930, at Karachi, to Leda, wife of Sq. Ldr K. Graeme Leask, M.C..—a daughter (Natalia).

LINDBERGH.—On June 22, at Englewood, N.J., U.S.A., to Anne, (née Morrow), wife of Col. Charles August Lindbergh,—a son.

MARRIAGE.

BROWN—STANBURY.—On June 19, at Sandgate, Kent, Keith Kendle Brown, R.A.F.O., to Gwendoline, elder daughter of Mr. and Mrs. F. B. Stanbury, Bycliffe, Sandgate.

ROWE-PATTULLO.—The marriage took place on June 17 at Albury, of Flt. Lt. Francis Charles Thorn Rowe, only son of Mr. and Mrs. F. C. Rowe, of Mill End, Chagford, Devon, and Dr. Constance Isobel Pattullo, of 144 Harley Street, elder daughter of Mr. and Mrs. J. D. Pattullo, of Hurst Lea, Albury Heath, Surrey.

FORTHCOMING MARRIAGES.

CARTER—BOWEN.—The engagement is announced between Flt. Lt. Ronald Hartley Carter, R.A.F., younger son of Brig.-Gen. C. H. P.

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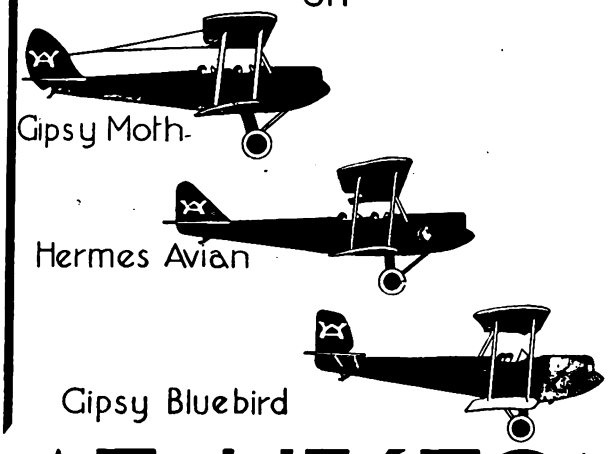

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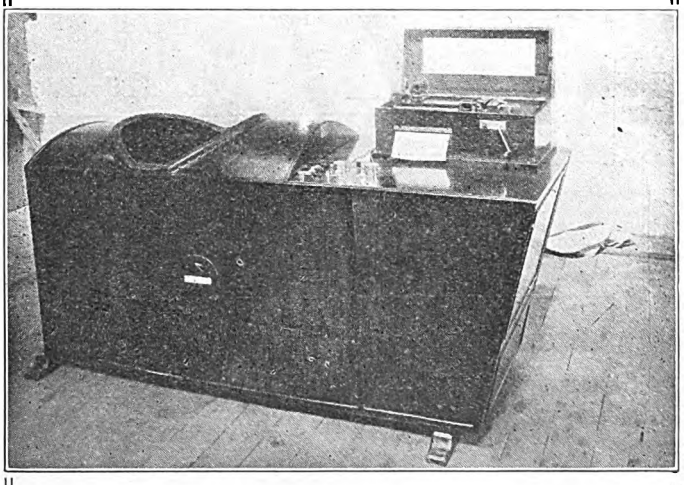

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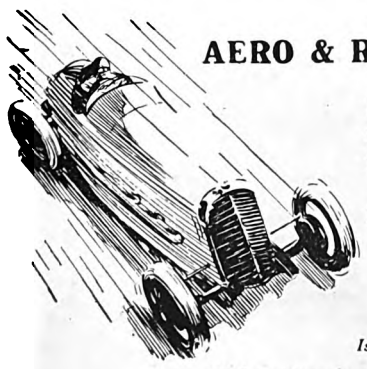

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Carter, C.B., C.M.G., C.B.E., and the late Mrs. K. M. Carter, and Eileen Mary Dorothea, younger daughter of Maj. G. C. Bowen, D.S.O., and Mrs. Bowen, of 40, Madeley Road, Ealing.

LEWIS-ROBERTS—GRESHAM.—The engagement is announced between Flt. Lt. A. O. Lewis-Roberts, D.F.C., R.A.F., elder son of Mr. and Mrs. Lewis-Roberts, Dundee, Natal, and Marjorie, elder daughter of Lieut-Col. and Mrs. H. E. Gresham, Branksome Manor, Bournemouth, W.

DEATHS.

SMYTHIES.—On John 17, at North Weald, Essex, as the result of a flying accident, Wing Commander Bernard Edward Smythies, D.F.C., R.A.F.

Wing Commander Smythies was born in India in 1886 and was educated at Cheltenham and the R.M.A., Woolwich. He entered the Royal Engineers in 1905 and was promoted to Captain in October 1914. He learned to fly on a Bristol biplane at Brooklands and his Royal Aero Club certificate No. 816 is dated June 19, 1914. He graduated at the Central Flying School, Upavon, and was seconded to the Royal Flying Corps in 1915 for duty as a Flying Officer.

He was posted to No. 9 Squadron headquarters at St. Omer to help in the development of what was the first wireless co-operation unit. About three months later this unit was absorbed by the Aircraft Park and a small wireless operators' school was formed.

He returned to England at the end of 1915 but went back to France in command of a Squadron in the summer of 1917. He was awarded the D.F.C. in January 1919 for distinguished services during the War.

In August 1919 he was granted a permanent commission with the rank of Squadron Leader. In 1922 he attended a course at the R.A.F. Staff College, Andover, and in 1923 he was posted to the Air Ministry, Directorate of Operations and Intelligence. He was promoted to Wing Commander in June 1923.

In April 1927 he was appointed to command No. 99 (Bomber) Squadron at Bircham Newton and in August 1929 he was appointed to command the R.A.F. Station at North Weald.

Wing Commander Smythies won the second prize in the Gordon Shephard Memorial Essay competition in 1920, the second prize in the R. M. Groves Memorial Essay competition in 1922 and the first prize in the R. M. Groves Memorial Essay competition in 1926 and 1930.

CLAXTON.—On June 18 at Farnborough as the result of a flying accident, John Cecil Lauga Claxton, Flying Officer, R.A.F. Mr. Claxton entered the R.A.F. with a short service commission in July 1928 and after a course of flying training at No. 2 F.T.S., Digby, he was posted, in June 1929 to No. 9 (Bomber) Squadron. He was attached to the School of Photography, Farnborough, at the time of the accident.

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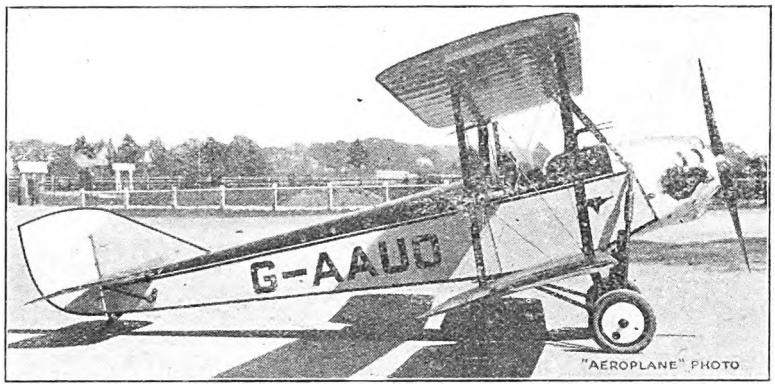

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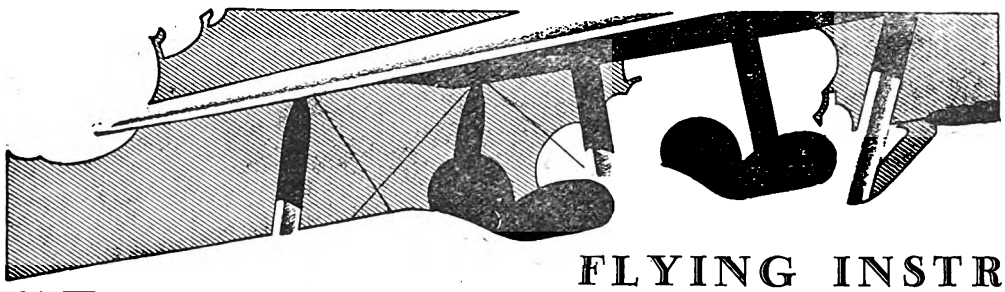

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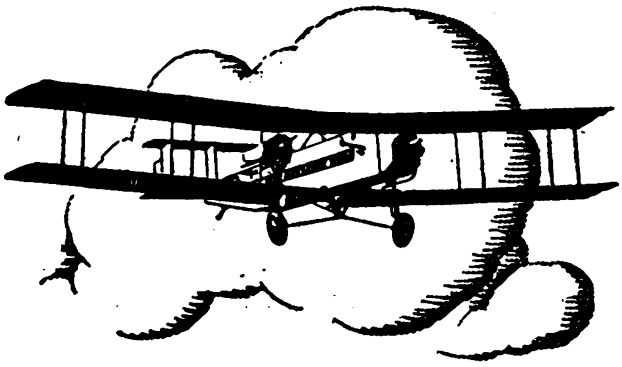

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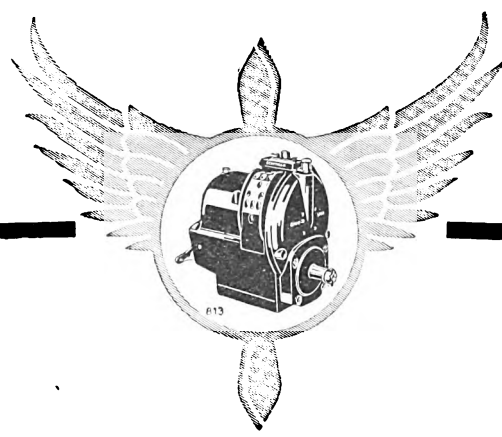

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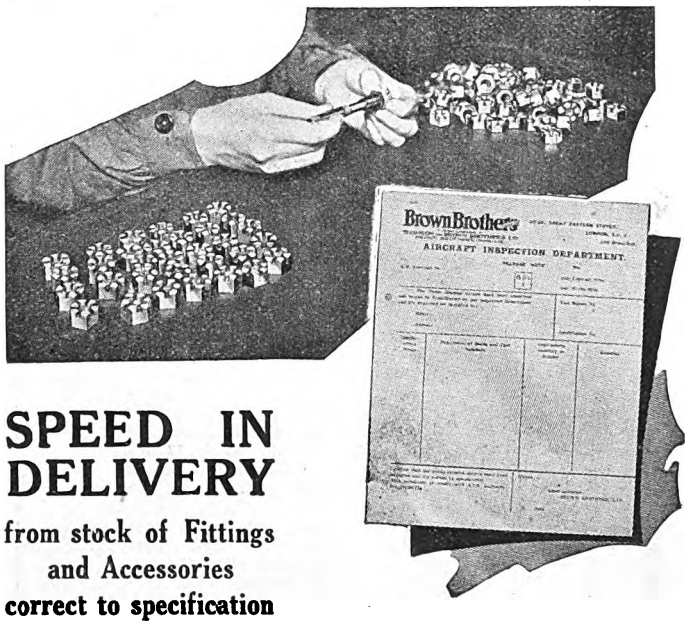

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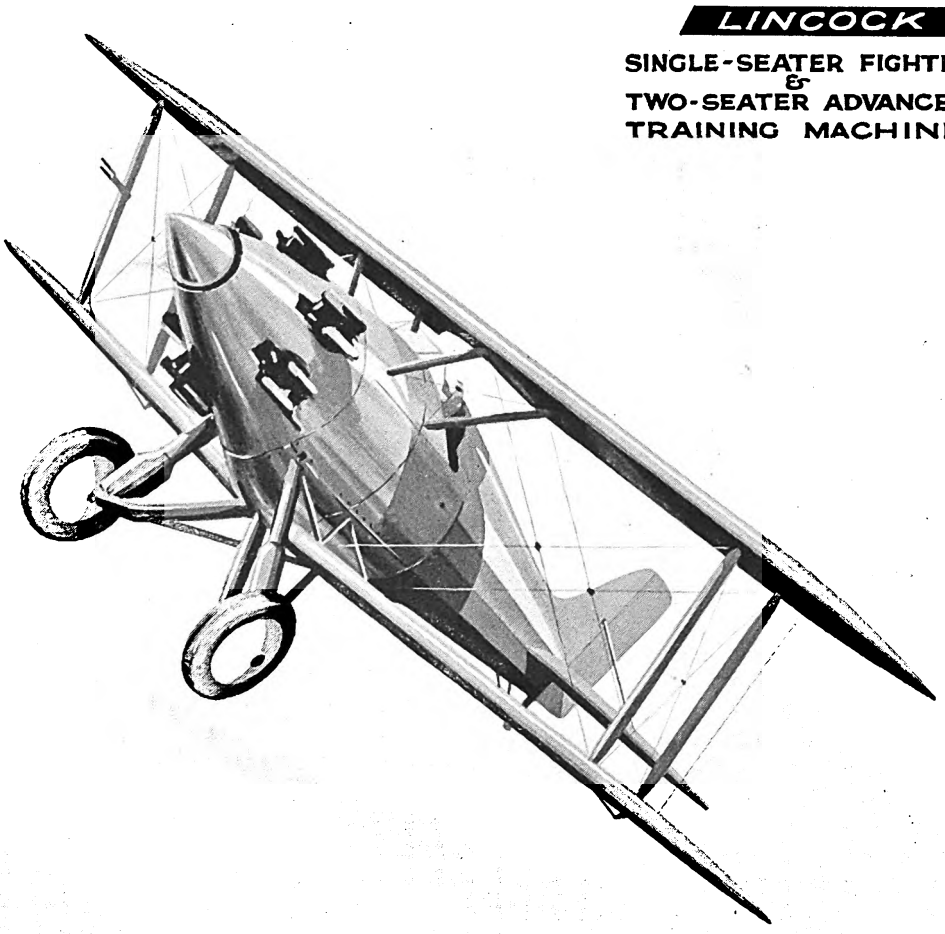

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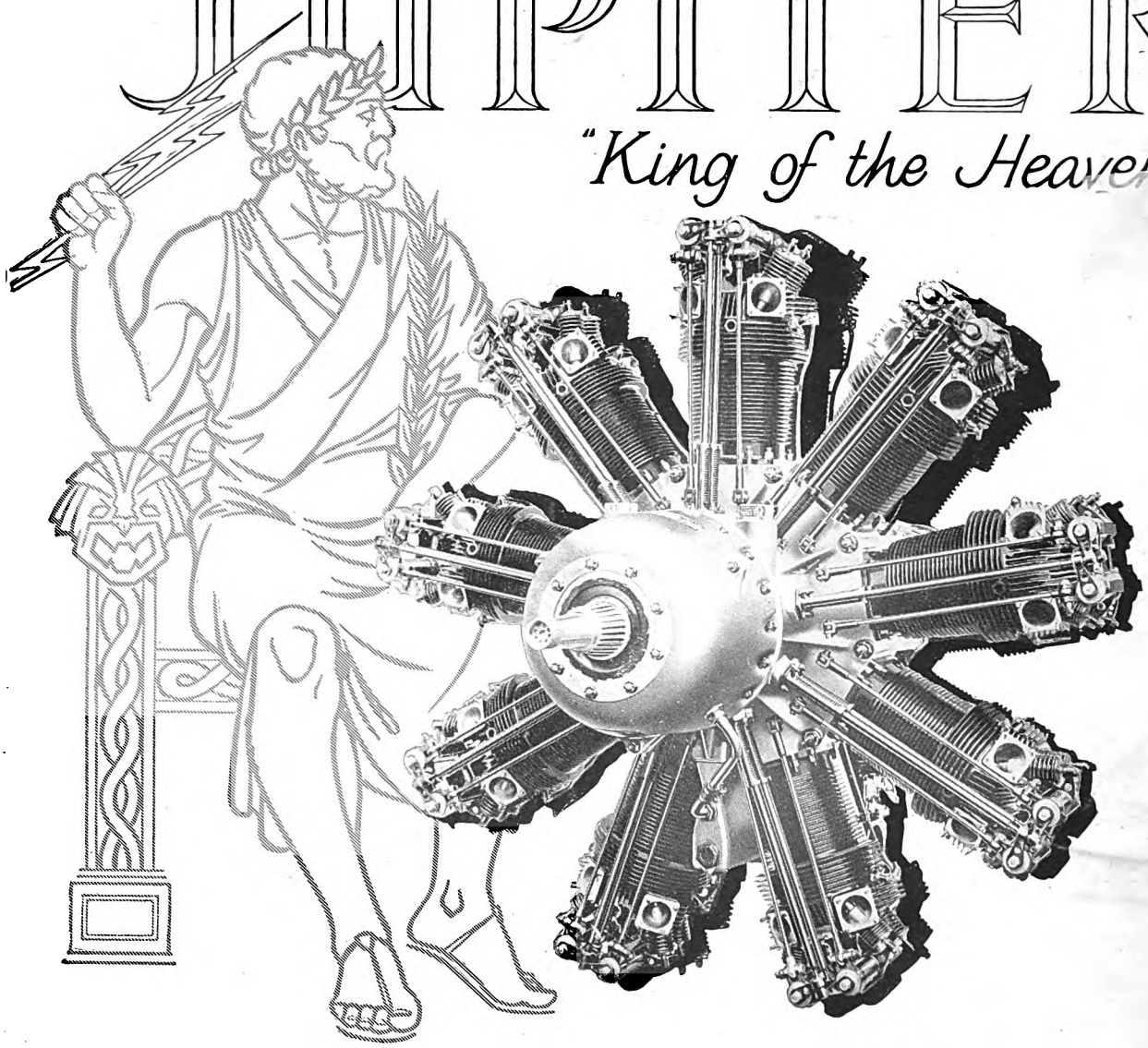

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